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HISTORY OF MEDICINE

SPECIMEN EXTRACTS

(SECOND SERIES)

JOHN D. COMRIE, M.A., B.Sc., M.B.

LECTURER

INTRODUCTION

IN the following specimens of old masters in medicine an attempt has been made to continue a similar series translated from classical medical writers, and to present extracts illustrative of the position occupied by the healing art, and of some advances made in it at successive periods from the fourth century to the eighteenth.

No continuity of subject is attempted, since the extracts are chosen simply for illustration of different points dealt with in the writer's lectures and for distribution to the students attending these, by whom access to copies of old medical writers cannot readily be obtained.

For the same reason, and because a selection had to be made, many important authors are not represented.

J. D. C.

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University of Edinburgh

HISTORY OF MEDICINE

SYLLABUS OF LECTURES

(Summer Session, 10th May 1910)

Lecturer—JOHN D. COMRIE, M.A., B.Sc., M.B.

LECTURE I.—**Roman Medicine** in the declining Empire. The Compilers; Oribasius (326-403); Aëtius (c. 550); Alexander of Tralles (525-605); Paulus Aegineta (c. 600). Cosmus and Damianus. Estimation of Medicine among the barbarians. Old Saxon Medicine. Medicine of the Monks.

LECTURE II.—**Arab Medicine** and its relation to Greek Medicine; Honein ben Isaac (809-873). Physicians of the Eastern and Western Caliphates; Rhazes (c. 900); Avicenna (980-1037); Haly Abbas (c. 980); Abulcasim (c. 1000); Averroës (1126-1198). Use of the Cautey. Introduction of Eastern drugs. Charitable hospitals. Relations to modern Medicine.

LECTURE III.—**School of Salerno**; medical regulations of Frederick II. Translators from the Arabic; Constantinus Africanus (1015-1087); Michael Scot (c. 1175-1230); Albertus Magnus (1193-1280).

Schools of Montpellier, Paris, and Bologna; Lanfranchi (c. 1280); Henri de Mondeville (c. 1300); Arnald of Villanova (c. 1240-1300); Bernard de Gordon's

“Lilium Medicinae” (c. 1300); Guy de Chauliac (c. 1290-1370).

Mediaeval Medicine in England—John of Gaddesden’s “Rosa Anglica Medicinae” (c. 1310); in the Low Countries, Jehan Yperman’s Surgery (c. 1300); in Germany, Pfolsprundt’s Surgery (1460). Review of Mediaeval Surgery and Pathology.

LECTURE IV.—Mediaeval Epidemics and Endemics. Plague; early outbreaks; modern discoveries and regulations. Leprosy. Syphilis; theories of origin. Dancing Mania. Sweating Sickness. Effect of the Hundred Years’ War.

LECTURE V.—Rise of the Italian Schools. The Renaissance. Florentine Guild of Physicians and Apothecaries. Revival of Anatomical Study; Mondino (1275-1326); the Renaissance Artists (c. 1500); Sylvius (1478-1555); Vesalius (1514-1564); Falloppius (1523-1562); Eustachius (——— -1574); Vidius (*fl. c.* 1569); Varolius (1543-1575).

LECTURE VI.—Improvement of Surgery. Guilds of Surgeons and Barber-Surgeons. Collège de St. Côme. Ambroise Paré (1510-1590) and his followers. **Contributions of Alchemy** to Medicine; Paracelsus (1493-1541); van Helmont (1578-1644). **Discoveries in Electricity** and Magnetism; Gilbert (1540-1603). Development of scientific method in Medicine; Lord Verulam (1561-1626).

LECTURE VII.—Development of Physiology; Servetus (1511-1553); Fabricius (1537-1619); Harvey (1578-1657); Aselli (1581-1626); Pecquet (1622-1674); Hales (1677-1761); von Haller (1708-1777); Galvani (1737-1798). **Introduction of the Microscope** and development of Histology; Malpighi (1628-1694);

Leeuwenhoek (1632-1723); Havers (1655-1702). **Improvement of Clinical Medicine**; Sydenham (1624-1689).

LECTURE VIII.—**Rise of the Dutch Universities**; Boerhaave (1668-1738); van Swieten (1700-1772); Gaubius (1705-1780).

Development of Medical Systems: *Iatro-mechanical*; Borelli (1608-1679); Pitcairne (1652-1713): *Iatro-chemical*; Sylvius (de le Boë) (1614-1672): *Ani-mistic*; Stahl (1660-1734): *Brunonian*; J. Brown (1735- ———).

LECTURE IX.—**Rise of the English Schools. Surgeon-Anatomists** of the eighteenth and early nineteenth centuries; Bidloo (1649- ———); Cheselden (1688-1752); Petit (1674-1750); Monro (1697-1767); Pott (1713-1788); W. Hunter (1718-1783); J. Hunter (1728-1793); Chopart (1743-1795); Desault (1744-1795); Richter (1742-1812); Scarpa (1747-1832); Abernethy (1764-1831); Cooper (1768-1841); Larrey (1766-1842); C. Bell (1774-1842); Dupuytren (1777-1839); Liston (1794-1847); Brodie (1783-1862). **Improvements in Obstetrics**; H. Chamberlen (c. 1670); Smellie (c. 1750).

LECTURE X.—**Advance of Medicine** in the eighteenth and early nineteenth centuries. Mead (1673-1754); Cullen (1710-1790); Gregory (1724-1773). **Morbid Anatomy**; Morgagni (1682-1771); Bichat (1771-1802); Bayle (1774- ———). **Vaccination**; Jenner (1749-1823). **Physical Diagnosis**; Auenbrugger (1722-1809); Corvisart (1755-1821); Laënnec (1781-1826). Bright (1789-1858); Addison (1793-1860); Graves (1796-1853).

SPECIMEN EXTRACTS

(SECOND SERIES)

ORIBASII (326–403 A.D.), *physician and friend of the Emperor Julian, was born at Pergamos, lived in the Byzantine court, and made several compilations from the best medical authors. On the death of Julian, being banished from the Empire, he was received with the highest honours by the Gothic king.*

ΟΡΕΙΒΑΣΙΟΥ ΙΑΤΡΙΚΩΝ ΣΥΝΑΓΩΓΩΝ ΠΡΟΣ ΙΟΥΛΙΑΝΟΝ

Βιβ. α'. Προοίμιον. — τὰς προσταχθείσας ἐπιτομὰς παρὰ τῆς σῆς Θειότητος, αὐτόκρατορ Ἰουλιανέ, πρότερον, ἡνίκα διετρίβομεν ἐν Γαλατίᾳ τῇ πρὸς ἐσπέραν, εἰς τέλος ἤγαγον, καθὼς ἡβουλήθης, ἄστινας ἐκ μόνων τῶν ὑπὸ Γαληνοῦ γραφέντων ἐποίησάμην. ἐπεὶ δὲ ἐπαινέσας ταύτας, δευτέραν ἐπέταξας πράξιν, πάντων τῶν ἀρίστων ἱατρῶν ἀναζητήσαντά με τὰ καιριώτατα συναγαγεῖν καὶ πάντα ὅσα χρησιμεύει πρὸς αὐτὸ τὸ τέλος τῆς ἱατρικῆς, καὶ τοῦτο πράττειν, ὥς οἶός τέ εἰμι, προθύμως διέγνωκα, χρησιμωτάτην ὑπολαμβάνων ἔσεσθαι τὴν τοιαύτην συναγωγὴν, τῶν ἐντυγχανόντων ἐτοίμως ἐξευρισκόντων τὸ ἐκάστοτε τοῖς δεομένοις ὠφέλιμον.

Βιβ. ι'. γ'. Περὶ τῶν αὐτοφυῶν λουτρῶν. Ἐκ τῶν Ἀντύλλου.

τῶν δὲ αὐτοφυῶν λουτρῶν πολὺ ἡ δύναμις ἐστὶν ἰσχυροτέρα καὶ δραστικωτέρα τῶν ἐξ ἐπιτεχνήσεως· εἴσι δὲ διαφοραὶ πλείους παρὰ τὴν τῆς γῆς ποιότητα, διὰ ἧς φέρεται· τὰ μὲν γάρ ἐστι νιτρῶδη, τὰ δὲ ἄλμυρά, τὰ δὲ στυπτηριώδη, τὰ δὲ θειώδη, τὰ δὲ ἀσφαλτώδη, τὰ δὲ χαλκανθώδη, τὰ δὲ σιδηρίζοντα, τὰ δὲ σύνθετα ἐκ τούτων, πλειόνων ποιοτήτων ὁμοῦ συμμιγνυμένων. πάντων μὲν οὖν τῶν αὐτοφυῶν ὑδάτων ἡ δύναμις ἐστὶ ξηραντικὴ καὶ θερμαντικὴ, τὸ ἐπίπαν σφόδρα εὐτόνων ὑπαρχόντων· διὸ δὴ καὶ τοῖς ὀξέσι νοσήμασιν οὐχ ἀρμόζει, ἀλλὰ μᾶλλον τοῖς χρονίοις, καὶ τούτων μάλιστα τοῖς καθύγροις καὶ ψυχροῖς. ἤδη δὲ τὰ μὲν νιτρῶδη καὶ ἄλας ἔχοντα κεφαλῇ κατάλληλα καὶ θώρακι ρευματιζομένῳ, καὶ στομάχῳ καθύγρῳ καὶ ὑδρωπικοῖς, οἰδήμασί τε τοῖς ἐκ νόσων, καὶ συγκρίσει φλέγματος γεννητικῇ· τὰ δὲ στυπτηριώδη αἵματός τε ἀναγωγαῖς, καὶ ἐμετικῷ στομάχῳ, καὶ τοῖς ἀμέτρως ὑπὸ αἱμορροϊδῶν ἐνοχλουμένοις, καὶ γυναιξὶν ἀτάκτως καθαιρομέναις καὶ συνεχῶς ἐκτιτρωσκούσαις.

Βιβ. μζ'. ιδ'. Περὶ ἀκρωτηριασμοῦ. Ἐκ τῶν Ἡλιοδώρου.

ἀφαιρεῖται χεῖρ, ἢ πούς, γαγγραίνης γενομένης, ἢ ἐξ ἄλλης αἰτίας νεκρωθέντος ἄκρου τινός. τὰ μὲν οὖν κάτω μέρη τῶν ἄκρων ἀκινδυνότερον ἀφαιρεῖται, τὰ δὲ ὑπεράνω ἀγκῶνος ἢ γόνατος μετὰ κινδύνον, διὰ τὸν κατὰ τὸ πλείστον ἐν χερσὶ κατὰ αἱμορραγίαν γινόμενον κίνδυνον, μεγάλων ἀγγείων διακοπτομένων. ἔνιοι μὲν οὖν κενόσπουδον τάχος ἐπιτηδεύοντες, κατὰ μίαν ἐπιβολὴν ὅλα τὰ σώματα ἐπιχαράσσουσιν, ἔπειτα ἐκπρίζουσι τὰ ὀστέα. οὐ γίνεται δὲ ἀκίνδυνος ἡ τοιαύτη ἀφαίρεσις, πολλῶν ἀγγείων κατὰ τὸν αὐτὸν καιρὸν αἱμορραγούντων· διό μοι δοκεῖ τὰ ἀσαρκότερα μέρη τοῦ

MEDICAL COMPILATIONS OF ORIBASIIUS FOR JULIAN

Bk. I. PREFACE.—I first finished, in accordance with your desire, those abridgments which your Divinity, Emperor Julian, ordered me to make while we were travelling in Western Gaul. These I made solely from Galen's writings. As these met with your approval you entrusted me with a second task, namely to look out and collect the principal views of all the best physicians and whatever was of most use in furthering the aims of medicine. I have quite willingly made up my mind to undertake this work to the best of my ability, for I see that a compilation of this kind will prove most useful, since any who chance to read it will easily find what is needful for the requirements of any case.

Bk. X. 3. ON NATURAL MINERAL BATHS. (From the Works of Antyllus)

The action of natural baths is much more powerful and efficacious than that of artificial ones. There are also differences in mineral waters due to the nature of the soil through which each passes. Some are alkaline, others saline, others aluminous, others sulphurous, others bituminous, others contain copperas, others iron; others again are combinations of these due to the mixture of several substances. Now all these natural mineral waters have a drying, warming action, generally speaking they are very powerful. So they are not suitable for acute troubles, but rather for chronic illnesses, particularly the moist and cold. First those which are alkaline and saline are suitable for catarrh in the head or chest, for fluidity of the belly, and dropsy, for swellings caused by disease, and for a constitution productive of phlegm. Then alum baths are suitable for spitting of blood and for a vomiting stomach, for those who are greatly troubled by piles, and for women whose purification is irregular or who constantly miscarry.

Bk. XLVII. 14. ON AMPUTATION. (From the Works of Heliodorus)

The hand or the foot is removed when gangrene has set in or when the extremity is dying for any other reason. The distal parts of the extremities may be removed without risk, those proximal to the elbow or knee with risk owing generally to sudden haemorrhage, as the vessels cut are large. Some seeking haste as a fad, divide all the muscles at one slash, and then saw the bones; but such an amputation is not without risk, because many vessels spurt blood at the same time; so it seems good to me first to cut the less fleshy

κώλου πρότερον διελεῖν, ὥς κατὰ τὸ ἀντικνήμιον, ἔπειτα πρίζειν, καὶ μετὰ τὴν τῶν ὀστέων πρίσιν τὰ λοιπὰ σώματα διακόπτειν πρὸς τὴν τοῦ μέρους ἀφαίρεσιν.

ΟΡΕΙΒΑΣΙΟΥ ΠΡΟΣ ΕΥΣΤΑΘΙΟΝ ΤΟΝ ΥΙΟΝ ΑΥΤΟΥ ΣΥΝΟΨΙΣ

λογ. θ. ζ'. περὶ πλευρίτιδος. ἐκ τῶν Γαληνοῦ.—ἡ ἀκριβὴς πλευρίτις ἐν πρωτοπαθείᾳ τοῦ ὑπεξωκότος γίνεται· διὸ μέχρι κλειδὸς καὶ ὑποχονδρίων ὁ πόνος ἐξικνεῖται. εἰ μὲν οὖν εἰς κλεῖν ὁ πόνος διατείνει, φλεβοτομίας χρεῖα· εἰ δὲ εἰς ὑποχόνδριον, καθάρσεως· εἰ μέντοι μέτριον εἴη τὸ ἄλγημα καὶ μὴ νυγματῶδες, οὐ μεγάλης δεῖται βοηθείας. δώσομεν οὖν τοῖς οὕτω κάμνουσι φάρμακα τῆς λεπτυνούσης δυνάμεως, μέτρια μὲν ἐπὶ τῶν φλεγμαινόντων, ὅσα δὲ ἰσχυρότερα κατὰ τὰς παρακμὰς τῶν φλεγμονῶν. μέτρια μὲν οὖν ἐστὶν ὃ τε τῆς πτισάνης χυλὸς καὶ τὸ μελίκρατον· ἰσχυρότερον δὲ τὸ τῆς ἀκαλήφης σπέρμα καὶ ὅταν ἐμβληθῇ τι τῷ μελικράτῳ τῶν δριμυιῶν βοτανῶν, οἷον ὀριγάνου καὶ ὑσσώπου καὶ καλαμίνθης, γληχοῦς τε καὶ ἴρεως.

PAULUS AEGINETA (circa 600 A.D.) was the most celebrated of the Greek medical writers of the later Empire. The sixth book of his Outline (ὑπόμνημα) of Medicine deals with surgery, and was a text-book renowned throughout the Middle Ages.

ΠΑΥΛΟΥ ΑΙΓΙΝΗΤΟΥ ΙΑΤΡΟΥ ΑΡΙΣΤΟΥ ΒΙΒΛΙΑ ΕΠΤΑ

Περὶ ἀνευρύματος.—τὸ ἀνεύρυσμα ὄγκος εὐαφής ἐστὶ καὶ τοῖς δακτύλοις ὑπείκων ἐξ αἵματός τε καὶ πνεύματος ἔχων τὴν γένεσιν. . . . τὰ δὲ ἐν τοῖς ἄκροις καὶ τοῖς κώλοις ἢ ἐν κεφαλῇ χειρουργητέον οὕτως· εἰ μὲν κατ' ἀνευρυσμὸν ὁ ὄγκος ἐγένετο διαίρεσιν εὐθείαν ἐμβαλλοῦμεν τῷ δέρματι κατὰ μῆκος. ἔπειτα διαστεύσαντες ἀγκίστροις τὰ χεῖλη, καθάπερ ἐπὶ τῆς ἀγγειολογίας ἐλέγομεν περιδέροντες, καὶ δι' ἐξ ὑμενιστήρων διακαθαίροντες, γυμνώσομεν τὴν ἀρτηρίαν. καὶ τῇ τῆς βελόνης διαγωγῇ τῇ τε διὰ τῶν δύο βρόχων ἀπολινώσει χρισάμενοι νύξαντες πρότερον φλεβοτόμῳ μεταξὺ τῆς ἀρτηρίας καὶ ἐνώσαντες τὸν περιερχόμενον τῇ πυοποιῷ χρυσώμεθα θεραπείᾳ ἄχρις ἀποπτωσέως τῶν βρόχων.

parts of the limb, such as down the front of the leg, then to saw, and after the sawing of the bones to cut through the remaining muscles for the removal of the part.

THE SYNOPSIS OF ORIBASIIUS FOR HIS SON EUSTATHIUS

Bk. ix. 7. ON PLEURISY. (From the Works of Galen.)—True pleurisy begins with an affection of the pleural membrane; thus the pain reaches to the clavicle and to the hypochondrium. If then the pain extends to the collar-bone, blood-letting is necessary; if to the hypochondrium, purging. If, however, the pain be moderate and not stabbing, it requires but little treatment. We shall give therefore to persons thus affected drugs of attenuating power, those which are moderately so to the fevered, and those which are stronger as the inflammation abates. Moderate remedies are the decoction of barley and honied milk; while nettle-seed and honied milk, to which one has added some of the pungent herbs, like marjoram, hyssop, mint, pennyroyal and iris, are stronger remedies.

THE SEVEN BOOKS OF PAULUS AEGINETA THE EXCELLENT PHYSICIAN

ON ANEURYSM.—Aneurysm is a tumour soft and yielding to the fingers, produced by blood and spirit. . . . But those which are on the extremities, limbs, or head must be operated on thus. If the swelling has developed as an aneurysm we make a straight cut lengthwise in the skin: then separating the lips with hooks, and stripping off the skin around as we described in treating of blood-vessels, and freeing it from its membranes, we lay bare the artery. We pass a needle under it and tie it with two ligatures. We then divide it between the ends of the artery with a lancet with which we cut around (the aneurysm), and then use suppurative treatment till the ligatures fall off.

Περὶ καθετηρισμοῦ καὶ κλυσμοῦ κύστεως.—πολιφθέντος οὔρου κατὰ τὴν κύστιν διὰ τινὰ ἔμφραξιν οἶον ἀπὸ θρόμβων ἢ λίθων, ἢ ἄλλην αἰτίαν τινὰ χρησώμεθα καθετηρισμῷ προσκομιδὴν τοῦ περιττοῦ. λαβόντες οἶον πρὸς ἡλικίαν καὶ γένος ἀρμόζοντα καθετῆρα εὐωδιάσωμεν αὐτόν. ὁ δὲ τοῦ εὐωδιασμοῦ τρόπος τοιοῦτός ἐστιν. ἔριον σμικρὸν λίνῳ δήσαντες κατὰ τὴν μεσότητα τὸ λίνον τε δι' ὀξύρρινον διαγαγόντες διὰ τῆς τοῦ καθετηρίου σύριγγος, τὸ ἔριον ἐφαρμόσωμεν τῷ βήματι τῷ πρὸς τῷ πυρῇνι τοῦ καθετῆρος. καὶ ψαλίσαντες τὰ ἐξέχοντα τοῦ ἐρίου καθίσωμεν εἰς ἔλαιον τὸν καθετῆρα, τὸν δὲ κάμνοντα χρηματίσαντες εἰς καθέδρυν προκάταιονήσαντες εἰ μὴ τι κωλύοι. λαβόντες τε τὸν καθετῆρα, καθήσωμεν ἐπ' εὐθείας πρῶτον ἄχρι βάσεως τοῦ καυλοῦ. καῖπειτα τὸ αἰδοῖον ἀνακλάσωμεν, ὥς πρὸς τὸν ὀμφαλόν. καὶ γὰρ ἀπὸ τούτου τοῦ μέρους σκολιὸς ὑπάρχει τῆς κύστεως ὁ πόρος. καῖπειθ' οὕτως τὸν καθετῆρα προσοίσωμεν. ἐπειδὰν δὲ κατὰ τὸν περίναιον πλησίον τῆς ἔδρας γένηται πάλιν τὸ αἰδοῖον ἐγκειμένου τοῦ ὀργάνου κατακάμψωμεν εἰς τὸ κατὰ φύσιν ἐπάγοντες χρήμα. ἀπὸ τοῦ περιναίου τῆς κύστεως ὁ πόρος ἄνω τείνει. προσβιβάσωμέν τε τὸν καθετῆρα, ἕως τὴν κύστιν κενεμβατήσῃ. μετὰ δὲ ταῦτα ἐπισπασώμεθα τὸ ἐγκείμενον τῷ καθετῆρι λίνον ἵνα τῷ ἐρίῳ συνεφελκόμενον τὸ οὔρον ἐπακολουθήσῃ καθάπερ ἐπὶ τῶν σομφώνων γίνεται. τοιοῦτος μὲν ὁ τῆς καθέσεως τρόπος. ἐπειδὴ δὲ πολλάκις ἐλκωθεῖσαν κύστιν δεόμεθα κλύσαι, εἰ μὲν ὠτικοὶ κλυστήρες δύναιντο παραπέμπειν τὸ ἔνεμα, ἐκείνοις χρησώμεθα κατὰ τὸν εἰρημένον τρόπον παραπέμποντες αὐτούς· εἰ δὲ μὴ δυνατὸν εἶη, τῷ καθετῆρι προσαρμώσαντες τὸ δέρμα ἢ κύστιν βοείαν διὰ τῆς καθετῆρος ἐνέσεως ἐγκλύσωμεν.

Περὶ τῶν ἀπὸ τῶν γευστῶν ποιότητων δηλουμένων κράσεων.—μυελός, μαλακτικῆς τῶν σκληρυνομένων τε καὶ σκιρρουμένων σωματῶν. ἔστι δυνάμεως κάλλιστος μὲν ὁ τῶν ἐλάφων, ἐφεξῆς δ' αὐτῷ ὁ τῶν μόσχων· ὁ δὲ ταύρων καὶ τῶν τράγων δριμύτερός ἐστι καὶ ξηραντικώτερος· καὶ ὁ μὲν ἀπὸ τῶν κόλων λιπαρώτερός ἐστι καὶ μαλακτικώτερος, ὁ δὲ τῆς ράχεως σκληρότερός τε καὶ αὐχμηρότερος.

σίδηρος ἐν ἀποσβεσθεῖς ὕδατι πολλάκις ξηραντικὴν ἱκανῶς αὐτῷ δύναμιν ἀποτίθεται· πινόμενόν γ' οὖν ἀρμόττει σπληνικοῖς. εἰ δὲ εἰς οἶνον ἀποσβεσθεῖν κοιλιακοῖς τε καὶ δυσεντερικοῖς καὶ χολεριῶσιν ἐκλελυμένοις στομάχῳ ἀρήγει.

ON CATHETERISM AND WASHING OF THE BLADDER.—The urine being accumulated in the bladder by some stoppage such as clots or stones, or by some other cause, we employ catheterism to draw off the excess. Taking a catheter suited to the age and sex we dress it in the following manner. Having bound a little wool round the middle with a thread and pushed the thread through the beak along the tube of the catheter, we adjust the wool to the step on the rounded head of the catheter. And having trimmed the excess of wool we set the catheter in oil. After bathing the patient, if nothing prevent it, we set him in a chair. Taking the catheter we first push it straight down to the base of the penis. Then we pull up the privates towards the navel, for from this part the passage to the bladder is curved. And next we shall carry on the catheter thus. And when it comes down to the perineum near the anus we again lower the privates to their natural position, with the instrument enclosed, still pushing it on. From the perineum the passage to the bladder stretches upwards, and we let the catheter pass right on into the cavity of the bladder. After that we pull on the thread lying in the catheter so that the urine attracted by the wool follows on, as happens in sponges. Such is the method of the introduction. But as we often require to wash out an ulcerated bladder, if ear-syringes are able to effect the injection we use these in the manner described. But if it is not possible, we fit to the catheter a bag formed from the skin or bladder of an ox and, introducing the catheter, make the injection.

ON THE NATURE OF SUBSTANCES AS SHOWN BY THEIR TASTE.—Marrow is a softener of bodies hardened or engrained. That of stags is of most exquisite potency; next to it that of calves; that of bulls and goats is more pungent and drying. That from the bowels is more oily and softening, that from the spine is harder and drier.

Iron quenched in water often gives to it quite a drying property. Drunk, therefore, it suits diseases of the spleen. If quenched in wine it helps those suffering in belly and bowels and cholera patients with excessive looseness.

The Leech-Book compiled for Bald, an old English leech, dates from about 900–950 A.D. It is the earliest account left of Saxon medicine and shows many traces of Greek, Irish, and Scandinavian influence. It is learned but primitive.

LAECE BOC

I. xiii. Ðið hæf scearde hwit cwudu gecnuwa swiðe smale do æges þ þ hwite to 7 meng swa þu dest teafor onsnið mid seaxse seowa mid seolce fæste smire mid þonne mid þære sealfe utan 7 innan ær se seoloc rotige · gif tosomne teo rece mid handa smire eft sona.

xxv. Gif scancan synd forode nim banwyrht gecnuwa geot æges þ þ hwite meng tosomne scancforedum men. Ðið foredum lime lege þas sealfe on þ þ forode lim 7 forlege mid elmrinde do spilc to · eft simle niwa oþþ gehalod sie gerendra elm rinde 7 awyl fwiðe do þonne of þa rinde genim linsæd gegrind briwe wið þam elmes drænce þ bið god sealf foredum lime.

II. lix. Ðið þære healf deaðan adle 7 hwanon seo cume · seo adl cymð on þa swiðran healf þæs lichoman · oððe on þa wynstran · þær þa sina toslupað 7 beoð mid slipigre 7 þiccere wætan yfelre 7 yfelre þiccere 7 mycelre. þa wætan man scæl mid blodlæsum 7 drencum 7 læcedomum on weg adon. . . . Soðlice seo adl cymð on monnan æfter feowertigum oððe fiftigum wintra gif he bið cealdre gecyndo þonne cymð æfter feowertigum elcor cymð æfter fiftigum wintra his gærgetales · gif hit gingran men gelimpe þonne bið þ eadlæcnere · 7 ne bið seo ylce adl þeah þe ungleawe læcas wenan þ þ seo ylce healfdeade adl si. hu gelic adl on man becume on geogoðe on sumum lime swa swa seo healfdeade adl on yldo deð. . . . Gif mon sý þære healfdeaðan adle seoc · oððe bræc seoc · wýrc him oxumelli suðerne eced drenc ecedes 7 huniges 7 wæteres gemang. . . . Eal swa same se petra oleum he is god 7 feald to drincanne wið innan tiedernesse 7 utan to smerwanne on wintres dæge for þon þe he hæfð swiðe micle hæte for ðy hine mon sceal drincan on wintra. . . . þis eal het þus secgean Ælfrede cyninge domne Helias patriarcha on Gerusalem.

III. lxiv. Drenc wiþ deofles costunga · þefan þorn cropleac eletre ontwe bisceop wyrht finul cassuc betonice · gehalga þas wyrta do on ealu halig wæter 7 sie se drenc þær inne þær se seoca man inne sie 7 simle ær þon þe he drince sing þriwa ofer þam drence · deus in nomine tuo saluum me fac.

lxxiii. Gif men sie innelfe ute gecnua galluc awring þurh clað on cu wearme meolce · wæt þine handa þær on 7 gedo þ innelfe on þone man geseowe mid seolce wyl him þonne galluc .VIII. morgnas butan him leng þearf sie fed hine mid fersce hæne flæsc.

LEECH-BOOK (OF BALD) (Cockayne's Translation)

I. xiii. For hare-lip, pound mastic very small, add the white of an egg, and mingle as thou dost vermillion, cut with a knife (the false edges of the lip), sew fast with silk, then smear without and within with the salve, ere the silk rot. If it draw together, arrange it with the hand; anoint again soon.

xxv. If shanks be broken, take bonewort, pound it, pour the white of an egg (out), mingle these together for the shank-broken man. For a broken limb, lay this salve on the broken limb, and overlay with elm rind, apply a splint, again, always renew (these) till the limb be healed; clean some elm rind, and boil it thoroughly, then remove the rind, and take linseed, grind it for a brewit with the elms drink; that shall be a good salve for a broken limb.

II. lix. For the half dead disease and whence it cometh. The disease cometh on the right side of the body or on the left, where the sinews are powerless, and are (afflicted) with a slippery and thick humour, evil, thick and mickle. The humour must be removed with blood-lettings and draughts and leechdoms. . . . Well, the disease cometh on a man after forty or fifty winters; if he be of a cold nature, then it cometh after forty; otherwise it cometh after fifty winters of his tale of years; if it happen to a younger man then it is easier to cure, and it is not the same disease, though unclever leeches ween that it is the same half dead disease. How can a like disease come on a man in youth in one limb, as the half dead disease doth in old age? . . . If a man be sick of the half dead disease, or epileptic, work him with oxymel, a southern acid drink, a mixture of vinegar, and honey, and water. . . . Similarly also petroleum is good to drink simple for inward tenderness, and to smear on outwardly on a winters day, since it hath very much heat; hence one shall drink it in winter. . . . All this Dominus Helias, patriarch at Jerusalem, ordered one to say to King Alfred.

III. lxiv. A drink against temptations of the devil: tuftythorn, cropleek, lupin, ontrel, bishopwort, fennel, cassuck, betony; hallow these worts, put into some ale some holy water, and let the drink be in the same chamber as the sick man, and constantly before he drinketh sing thrice over the drink, "Deus, in nomine tuo saluum me fac."

lxxiii. If a man's bowel be out, pound galluc, wring through a cloth into milk warm from the cow, wet thy hands therein, and put (back) the bowel into the man, sew up with silk, then boil him for nine mornings galluc, except need be for a longer time, feed him with fresh hens flesh.

RHAZES (*circa* 900 A.D.), *born in Chorasan, practised later in Bagdad. He was a voluminous medical writer, and gave the first clear account of Small-pox and Measles.*

RHAZES ON THE SMALL-POX AND MEASLES
(Greenhill's Translation)

“In the name of Allah, the Compassionate, and Merciful.”

Abu Becr Mohammed Ibn Zacariya (i.e. RHAZES) says:—It happened on a certain night at a meeting in the house of a nobleman, of great goodness and excellence, and very anxious for the explanation and facilitating of useful sciences for the good of mankind, that, mention having been made of the Small-pox, I then spoke what came into my mind on the subject. Whereupon our host (may Allah favour men by prolonging the remainder of his life) wished me to compose a suitable, solid, and complete discourse on this disease, because there has not appeared up to this present time either among the ancients or the moderns an accurate and satisfactory account of it. And therefore I composed this discourse, hoping to receive my reward from the Almighty and Glorious Allah, and awaiting his good pleasure. . . . As to any physician who says that the excellent Galen has made no mention of the Small-pox, and was entirely ignorant of this disease, surely he must be one of those who have either never read his works at all, or who have passed over them very cursorily. . . . If, however, anyone says that Galen has not mentioned any peculiar and satisfactory mode of treatment for this disease, nor any complete cause, he is certainly correct; for, unless he has done so in some of his works which have not been published in Arabic, he has made no further mention of it than what we have just cited. . . . As to the moderns, although they have certainly made some mention of the treatment of the Small-pox (but without much accuracy or distinctness), yet there is not one of them who has mentioned the cause of the existence of the disease, and how it comes to pass that hardly anyone escapes it, or who has disposed the modes of treatment in their right places. . . . I am now to mention the seasons of the year in which the Small-pox is most prevalent; which are, the latter end of the autumn, and the beginning of the spring; and when in the summer there are great and frequent rains with continued south winds, and when the winter is warm, and the winds southerly. When the summer is excessively hot and dry, and the autumn is also hot and dry, and the rains come on very late, then the Measles quickly seize those who are disposed to them; that is, those who are of a hot, lean, and bilious habit of body. . . . The eruption of the Small-pox is preceded by a continuous fever, pain in the back, itching in the nose, and terrors in sleep. These are the more peculiar symptoms of its approach, especially a pain in the back, with fever; then also a pricking which the patient feels all over his body; a fullness of face, which at times goes and comes; an inflamed colour, and vehement redness in both the cheeks; a redness of both the eyes; a heaviness of the whole body; great uneasiness, the symptoms of which are stretching and yawning; a pain in the throat and chest, with a slight difficulty in

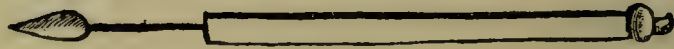
breathing, and cough ; a dryness of the mouth, thick spittle, and hoarseness of the voice ; pain and heaviness in the head ; inquietude, distress of mind, nausea and anxiety (with this difference, that the inquietude, nausea and anxiety are more frequent in the Measles than in the Small-pox ; while, on the other hand, the pain in the back is more peculiar to the Small-pox than to the Measles) ; heat of the whole body, an inflamed colour and shining redness, and especially an intense redness of the gums. . . . It is necessary that blood should be taken from children, youths and young men who have never had the Small-pox, or have had only the Chicken-pox (especially if the state of the air, and the season, and the temperament of the individuals be such as we have mentioned above), before they are seized with a fever, and the symptoms of the Small-pox appear in them. . . . We will now mention those medicines which thicken and cool the blood, and check its putrefaction and ebullition. These are checked by all acid things, such as vinegar, butter-milk water of extreme acidity (that is, the thin bitter water which floats upon butter-milk when it is exposed to the sun), and the acid juice of citrons ; and still more useful are those things which have an astringency joined to their acidity, such as the juice of unripe grapes, sumach, warted-leaved rhubarb, apples, quinces, and acid pomegranates. . . . Cold water, when it is sipped a little at a time, provokes sweat, and assists the protrusion of the superfluous humours to the surface of the body. Let the patient put on a double shirt, with the upper border closely buttoned ; and underneath let there be placed two small basins of boiling water, one before and the other behind him, so that the vapour may come to the whole body except the face ; and the skin may be rarefied, and disposed to receive and evaporate the superfluous humours. For when the surface of the body is in this state, the patient is suffused with sweat, which is calculated to cool him and is very beneficial. . . . As soon as the symptoms of the Small-pox appear, we must take especial care of the eyes, then of the throat, and afterwards of the nose, ears and joints, in the way I am about to describe. . . . In order to efface the pock-holes, and render them even with the surface of the body, let the patient endeavour to grow fat and fleshy, and use the bath frequently, and have his body well rubbed. . . . There is a bad and fatal sort of the white and large pustules, viz. those which become confluent and spread, so that many of them unite and occupy large spaces of the body or become like broad circles, and in colour resemble fat. As to those white pustules which are very small, close to each other, hard, warty, and containing no fluid, they are of a bad kind, and their badness is in proportion to the degree of difficulty in their ripening. And if the patient be not relieved upon their eruption, but his condition continues unfavourable after it is finished, it is a mortal sign. And as to those which are of a greenish, or violet, or black colour, they are all of a bad and fatal kind ; and when, besides, a swooning and palpitation of the heart come on, they are worse and still more fatal. And when the fever increases after the appearance of the pustules, it is a bad sign ; but if it is lessened on their appearance, that is a good sign.

ALBUCASIS, OR ABULCASIM (*circa 1000 A.D.*), was born at Cordova and wrote a comprehensive work on medicine of which three books are surgical. He owes much to Paulus Aegineta and other Greeks, and his "Surgery" was translated into Latin, Provençal, etc. He devotes one book to the use of the cautery. The MSS. of his works are copiously illustrated with figures of the instruments he used.

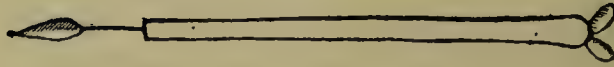
SURGERY OF ALBUCASIS (Translation from Channing's Latin Edition)

واعلم ان القدح لا يستغني فيه المتعلم عن المشاهدة مرات فتح (خجند)
يقدم على العمل، وقد بلغني عن العراقيين انه ذكر انه تصنع بالعراق
مقدحاً منفذاً يمض به الماء ولم ارا احداً في بلدنا صنع ذلك ولا
قراءته في كتاب من كتب الاول وقد يمكن ان يكون ذلك محدثاً،
وهذه صورة انواع عن المتماح ليقتف عليها من جهلها
ان شا الله تعالى.

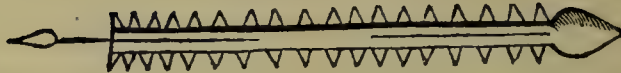
صورة مقدح



صورة مقدح آخر



صورة مقدح آخر



فصنع من النحاس خاصة ويكون طرفها بهذه الدقة بعينها صلبة
مثلثة الطرف الشكل حادة،

الفصل الرابع والعشرون في علاج اللحم النابت في الأنت،

قد تنبت في الأنت لحوم مختلفة زايدة منها شيء يستوي القربان
الكثير الأرجال ومنها ما يكون لحمًا سرطانياً متحجراً كمد
اللون ومنها ما يكون لحمًا بنيةً غير كمد اللون، فما كان من

Bk. I. Sec. 56. ON CAUTERISATION IN EXCESSIVE BLEEDING FROM A CUT ARTERY.—Very often a flow of blood takes place from an artery cut by accident from outside, or in the opening of an abscess, or burning of a limb, or such like; and it is hard to stop.

Therefore when this has happened to any, hasten with thy hand to the mouth of the artery, and place thy forefinger upon it stopping it well till the blood stay under thy finger, and nothing come from it. Then in the fire set cauteries of an olive shape large or small, many in number, and blow upon them till they be white hot; take then one of them large or small according to the relation and position in which the artery is torn, and place the cautery fairly upon the artery itself, after thou hast quickly removed thy finger. And hold the cautery therein till the blood be stayed. But if it spurt out after thou hast removed thy finger from the opening of the artery and extinguish the cautery, take then quickly another of those that are ready in the fire, nor cease to do this with one cautery after another until the blood is stayed. But have a care lest thou burn a nerve which may be there and so another calamity fall upon the patient. Know moreover when blood flows from an artery, it is not possible that the flow be stayed when the artery is great unless by one of four means: by the cautery in truth as we have said; or by division of that which had not been divided, for when it is divided its ends are drawn together, and the bleeding is broken off; or by firm binding with a thread; or by application of drugs possessed of styptic power with pressure made properly and firmly by the help of folded cloths. But they who try to stay the blood by ties or tight bandages or the application of caustics and the like succeed not altogether or at least but seldom. But if this happen to any when no physician or medicine is at hand, let him hasten to place his finger in the opening of his own wound, as we have written above, and perchance he may close it till the blood clot, and let him pour upon the wound and the artery (from which the finger is not removed) water as cold as possible, till the blood congeal and grow thick. And meantime let him reflect on that which may be necessary whether cautery or drug. May this be pleasing to Allah.

Bk. II. Sec. 23. ON THE CURE OF CATARACT.— . . . Know moreover that it does not suffice for a disciple to be instructed on the depression of a cataract, unless after he has seen that operation many times, then he may betake himself to the work. A certain man of Irak once came to me and said that in Irak the needle is made hollow so that by it the cataract is sucked out. In our country I have never seen it on this wise, nor have I seen it described in any book of the ancients. Perchance it is a new discovery. These then are figures of the kinds of needle, that he who is ignorant may turn to them. May Allah most good, most great, be pleased (*see Illustration in original on opposite page*) . . . Let them be made specially of bronze; and let their ends be of this same fineness, hard, of triangular form, and sharp at the point.

AVICENNA (980–1037 A.D.) *was the most celebrated Arabian philosopher of the Middle Ages. Born in Chorasan he lived at various Persian courts, and his "Canon of Medicine" translated into Latin formed an authoritative work in the West till long after the Renaissance.*

CANON MEDICINAE OF AVICENNA (from a Latin Translation
of 1608)

Lib. i. Fen. 3, Doct. 2, Cap. 4. OF FRICTION.—One kind of friction is hard, which enlarges or thickens; another is gentle, which loosens. One is prolonged, which causes thinness; another is moderate, which fattens. When these are combined, corresponding results will be produced. There is also a friction which is rough, as with rough cloths, which quickly draws the blood to the outward parts, and one which is smooth, as with the palm or with soft cloths, which collects the blood and keeps it in the part. Now, the objects of friction are:—the thickening of thin bodies, the hardening of soft ones, the thinning of thick ones, the softening of hard ones. Besides there is a friction of preparation, which comes before exercise, and is begun gently; this, when the desire to rise is felt, braces and hardens. Then there is the friction of restoration, which comes after exercise and is called rest-inducing friction. The object of this is the resolution of superfluities retained in the muscles, not evacuated by exercise, that they may be evaporated, and that fatigue may not occur. This friction must be done smoothly and gently.

Lib. ii. Tract. ii. Cap. 365. OF JABROL.—What is Jabrol? It is the root of the woodland mandrake, or of any kind of mandrake, large and of human shape; on this account it is called mandrake. For mandrake is the name of any natural object, for instance a growing plant, in human shape. It is immaterial whether the meaning of this name was discovered or not, for many names have now meanings which were not at first discovered; moreover, a form of mandrake has been found like spongy wood which is crumbling down like great costus. Nature.—It is cold in the third degree, dry in itself, and it has a slight amount of heat in the opinion of some. The root is strong and drying, while the rind of the root is weak. The dried leaves are also used, though they are sometimes applied moist, and in the mandrake itself there is moisture. Uses and properties.—It is narcotic, it exudes gum, and has juice, but the juice is stronger than the gum. Whoever wishes to have anything cut from his limbs may drink three measures of it in wine: this will produce insensibility.

Lib. iii. Tract. iv. Cap. 2. OF THE SIGNS OF PLEURISY.—The signs of simple pleurisy are quite clear. They are fever invariably

present because of the vicinity of the heart. Secondly, a stabbing pain under the ribs, since the membrane is shaggy, and often this is not apparent except when breathing. And sometimes there is tension with stabbing; sometimes this is very great. Tension signifies great extent and stabbing great severity in its penetration. The third sign is difficulty of breathing owing to compression caused by effusion, also the shallowness and frequency of breathing. The fourth is a saw-like pulse. The difference from the usual condition of the pulse is increased by the want of strength and the extent of the cause. The fifth sign is cough; sometimes the cough at the beginning of this illness is dry, and later with sputum; and whenever the cough is with sputum at the beginning it is matter for congratulation. The cough, however, does not occur unless the lung is affected by its proximity.

HALY ABBAS (*circa* 980) *was physician to the Emir Adhad-ed-Daula, who founded a public hospital in Bagdad.*

LIBER CONTINENS OF HALY ABBAS (from a Latin Translation
of 1523)

4. ON PRECAUTIONS AGAINST PESTILENTIAL DISEASES.—Since certain pestilential diseases arise from putrid vapours infecting the air, as vapours set free from the bodies of dead men and beasts, and likewise from water into which vegetables and much putrefied fruit have fallen, it is necessary, in addition to what has been said regarding the purification of the body and the regimen which counteracts its disorders, to depart from the district and locality in which those things occur, if that is possible. But if your dwelling be to the lee of winds which blow over these putrid things, or in caves with little moisture, or in houses through which but little air passes, you will sprinkle it with vinegar, strew it with myrtle and cool scents, and fumigate the place where you dwell with pleasant vapours such as wood-aloes, myrrh, sandal-wood, camphor, etc. If you fumigate it also with frankincense and sandarach it is very useful; multiply also cool and pleasant scents. Whosoever will be freed from pestilent diseases must be guided by this method. Moreover there is an observation upon infectious diseases like leprosy, scabies, phthisis, madness, small-pox, ophthalmia, and the like, since diseases of this sort pass to him who dwells with the sick man, let not one stay long with them, nor dwell in the same house as the sick, but let him go far off to places which are to the lee of winds that blow over them. And this collection of rules is useful for the man whose mind is fixed to save himself from pestilence and infectious disease, and that which has been said let it suffice.

“REGIMEN SANITATIS” or “SCHOLA SALERNITANA” is the name of a Latin poem dedicated to Robert, son of William the Conqueror, who stayed at Salerno in the year 1099. It was composed by the teachers of that Medical School, then in its prime; and its maxims were constantly quoted by subsequent medical writers.

REGIMEN SANITATIS SALERNITANUM

- 1-21. Anglorum Regi scripsit schola tota Salerni.
 Si vis incolumem, si vis te reddere sanum,
 Curas tolle graves, irasci crede profanum,
 Parce mero, coenato parum, non sit tibi vanum
 Surgere post epulas, somnum fuge meridianum,
 Non mictum retine, nec comprime fortiter anum :
 Haec bene si serves, tu longo tempore vives.
 Si tibi deficient medici, medici tibi fiant
 Haec tria, mens laeta, requies, moderata diaeta.
 Lumina mane manus surgens gelida lavet aqua,
 Hac illac modicum pergat, modicumque sua membra
 Extendat, crines pectat, dentes fricet. Ista
 Confortant cerebrum, confortant caetera membra.
 Lote, cale : sta, pranse, vel i ; frigesce, minute.
 Sit brevis aut nullus tibi somnus meridianus.
 Febris, pigrities, capitis dolor, atque catarrhus,
 Haec tibi proveniunt ex somno meridiano.
 Quatuor ex vento veniunt in ventre retento,
 Spasmus, hydrops, colica, vertigo, quatuor ista.
 Ex magna coena stomacho fit maxima poena.
 Ut sis nocte levis, sit tibi coena brevis.
- 29-30. Ova recentia, vina rubentia, pingua jura,
 Cum similia pura, naturae sunt valitura. . . .
- 135-137. Grossos humores nutrit cerevisia, vires
 Praestat, et augmentat carnem, generatque cruorem,
 Provocat urinam, ventrem quoque mollit et inflat. . . .
- 197-198. Crapula discutitur, capitis dolor, atque gravedo,
 Purpuream dicunt violam curare caducos. . . .
- 199-205. Aegris dat somnum, vomitum quoque tollit adversum,
 De Urtica. Compescit tussim veterem, colicisque medetur,
 Pellit pulmonis frigus, ventrisque tumorem,
 Omnibus et morbis subveniet articulorum.
 Hyssopus est herba purgans à pectore phlegma.
 Ad pulmonis opus cum melle cognatur hyssopus :
 Vultibus eximium fertur reparare colorem. . . .
- 212-213. Cum vino choleram nigram potator repellit :
 De Pulegio. Sic dicunt veterem sumptum curare podagram. . . .
- 219-221. Auribus infusus vermes succus necat ejus.
 De Salice. Cortex verrucas in aceto cocta resolvit.
 Pomorum succus flos partus destruit ejus. . . .
- 310-311. Hi sunt tres menses, Maius, September, Aprilis,
 In quibus eminas ut longo tempore vivas.

THE SALERNIAN REGULATION OF HEALTH

The whole school of Salernum wrote to the king of the English :—
If you desire to make yourself safe and healthy, get rid of anxious cares, believe it vulgar to get angry, abstain from wine, sup in moderation, let it not seem useless to rise up after a feast, avoid a noontday sleep, do not retain the urine, don't become costive. If you attend well to these, you will live a long time. If you lack doctors, these three may be your doctors—a joyful disposition, rest, a well-regulated diet. Let the riser in the morning bathe his eyes and hands in cold water, let him go gently this way and that, and gently stretch his limbs, then comb his hair, and brush his teeth. These things strengthen the brain, and strengthen all the limbs. When you have bathed, get warmed ; having dined, stand up or walk about ; if you have been bled, keep cool. Let your mid-day sleep be short or none at all. Fever, lethargy, headache, catarrh—these all arise from mid-day sleep. Four things proceed from wind retained in the belly—gripes, dropsy, colic, giddiness. A heavy supper causes much pain to the stomach.

Fresh eggs, red wines, thick soups, with plain bread, these are nature's nutriments. . . .

Beer produces thick humours, gives strength, increases flesh, makes blood, provokes urine, and softens and swells the belly. . . .

Intoxication, headache, catarrh are dispelled by the purple violet, which is said also to cure epileptics. . . .

(The nettle) gives sleep to the sick, removes troublesome vomiting, checks an old cough, cures colic, banishes cold of the lung and swelling of the belly, and is of assistance in all diseases of the joints. Hyssop is a herb which clears phlegm from the chest. A concoction of hyssop with honey is of use to the lungs : it is said to restore an excellent colour to the face. . . .

(Pennyroyal) drunk with wine drives out black bile ; taken thus it is said to cure long-standing gout. . . .

(Willow) is an infusion for the ears : its juice kills worms : a decoction in vinegar softens warts. The juice of its fruit and its flower prevent childbearing. . . .

These are the three months—May, September, April—in which you may be bled, if you wish to live long.

ARNALD OF VILLANOVA (*circa* 1240–1300 A.D.), *one of the early Montpellier School, wrote a treatise on “Praxis Medicinalis.” He was physician to several Popes at Avignon, was one of the first to introduce ideas of chemistry into medicine, and is distinguished by his rationalism. (From a printed edition of 1586.)*

PRAXIS MEDICINALIS

REGIMEN PODAGRAE.—Regimen sit tale: Primo cavebitis a comestione omnium leguminum & castanearum: brodio tamen uti poteritis, maxime cicerum, & pisorum, licet raro: item cavebitis a cibis factis de pasta: . . . item cavebitis a vino novo. . . . Item a carnib. leporinis & bovinis antiquis. . . . Sciendum quod si dolor non sedaretur cum praedictis, & sic esset intensus, quod amplius patiens tollerare non posset, in tali casu manifeste necessario isto esset utendum: Recipe opii, corticis radice mandragorae an. $\mathfrak{z}\text{i}$, molliter confice cum aqua portulacae, lactucae, vel hyoscyami, et informetur grana, & cum opus fuerit, dissolve ex istis granis cum aqua lactucae, vel portulacae, vel aliis succis frigidis, & utere. Verumtamen, si dolor fuerit ita fortis, quod istis medicinis non sedetur, unge locum cum aceto fortissimo calido.

ARNALD OF VILLANOVA, PRACTICE OF MEDICINE

TREATMENT OF GOUT.—This is the treatment: first you will avoid eating all vegetables and chestnuts; but you may use a broth of chick-pease and occasionally of peas; also you will avoid food made of pastry . . . also new wine. . . . Also the flesh of hares and old cattle. . . . You must know that if the pain is not settled by the aforesaid remedies, and if it is so intense that the patient cannot bear it longer, in such case the evident necessity is to use: R Opium, and mandrake-root-bark of each one ounce; soften with water of purslain, or lettuce or henbane, forming grains; and when need arises dissolve some of these grains with lettuce or purslain water or other cold juices, and use. However, if the pain is so strong that it is not settled with these remedies, apply to the part the strongest hot vinegar.

AVERROËS (1126–1198 A.D.), *born at Cordova, was distinguished chiefly for his writings on philosophy and religion. His chief medical work, the “Colliget,” is largely drawn from Galen.*

COLLIGET OF AVERROËS (from a Latin Translation of 1540)

Lib. I. Chap. xii., which is on humours. Now the humours which appear in the human body are four: to wit, blood, phlegm, yellow bile, and black bile.

Chap. xiii., which is on spirit. There are two spirits, one appearing in the heart, the other in the brain: but a spirit in the liver is not evident to the senses.

Lib. V. Chap. xiii., which is on medicines that soothe pain. The first method, then, of soothing pain is to remove the cause of pain; the second to stupefy the part so that it does not feel pain, as happens with opium; the third kind of medicine is that which produces something in the part to overcome the cause of pain, and this is the true soother. Under the first head fall many kinds of medicines, as purgative and digestive medicines. The second method does not truly relieve the pain but merely takes away the feeling of the part and hardens it—a method not to be used unless we are unable to avoid it as has been mentioned in the book “on the nature of health.” But the third is the true soother, for it produces immediately that which resists the cause of pain.

Chap. xlii. Licorice is moist in the first degree, and exceeds a little in heat a moderate constitution. S. has said that it is like the human constitution; and the sweetness of its vapour, and a slight stypticity show this. Also a moderate sweetness signifies heat and moisture. Its stypticity takes away part of its heat and moisture, except when it simply removes more of the moisture. It softens the roughness which is in the trachea and bladder and that of other parts liable to roughness.

qm istoy filioy eir recit. i qm dicit annul. Hup. Et atq di gwe nox. Noua d gait nistor
 L uuo ego puthael soc qui deli hunc librum latinitate. qd in anno .cc. xxi. ru kal
 nouemb. die iustu. accessit nobiliae dua tota ciuitas hononensis. q erit hospita mea. et erit me
 ti dulca. i nobilia sup aliud i sua ciuitate. Thracia. dicta vicia alba galli. i vicia. et
 adduxit ad me dictam uirgine i sapientie. maria noie hanc nobilz domibz i uicinia
 iuxta me. Et obtulit in maria duos lapides i specie ouoy. et un habuit celatum
 ad mod ou. i timo duoy lapi habuit i ciuitate q ier fomal. i reliq gallo
 litare. Et i pre annuoy q erunt p erit p de alledie. i pre p aon
 plus de uigredie. i p totu lapi i p lapidi pmi q erit ad mod ou
 fuit ciuitas uicini. tale uelle i i dicitur. et ex hoc uicini
 erit uig. cu lapi ad mod uicini. Et q ahe p hae talae
 i code lapide erit uicini. i dicitur uicini
 et illi facientes p hae ex se in abscida. bantur
 et in eis apertur signa. i uicini
 et in eis. i p hae tu. et in fuit
 uicini ad p hae uicini
 lapid. i medio.

LIBER PHISIONOMIAE (early printed Edition of 1497 ;
about two-thirds).

ter fortem superbum. cito presumptuosus. inuidi. cupidus
pulchrorum. et cito credentem. 2^o brachia sunt pinguis et
musculosa significant homines vanagloriosus. cupidus quanto
delectabilis. et pl^o insipiens quod sapiens in agendis 2^o brachia
sunt valde pilosa siue sint macra siue crassa et mollis carnis.
significant hominem luxuriosum. tenere capacitatis. debi-
lem. multe suspicionis. et sagaciter maliciosum. Qui^o bra-
chia sunt valde nuda pilis significant hominem tenere ca-
pacitatis. magne ire. cito credentem. vanum lassum. medace
facile fallace. sagacem in malo et debile.

De manibus.

La. lxxii.

Anus mollis carnis macre ⁊ longe significant ho-
minem boni intellectus tenere capacitatis ⁊ ex facili ti-
midum. libenter pacificum. satis legalem. discretum seruitu-
alem. domesticę cōuersatōis. ⁊ doctrinalem. Cuius man⁹
sunt valde grosse ac breues. significant hominem grossi in-
genii. simplicem. vanum. mendacem fortem laboriosū. si-
delem. cito credentem ⁊ breuis ire. Cuius manus sunt pi-
lose ⁊ grossorum pilorum ac digitorum ⁊ curuorum. sig-
nificant hominem luxuriosum. vanum mendacem. grossi
ingenii. ⁊ plus simplicem q̃ sapientem. Cuius manus in
digitis curuantur sursum significant hominem liberalem.
⁊ seruitialem. capacitatis bone. sagacem parū inuidū. lōge
ire. intellectus boni. ⁊ mediocrem inter secretum ⁊ non se-
cretum. Cuius manus sunt implicabiles versus extremaꝝ
partem digitorum significant hominem tenacem. cupidū ⁊
periculosū. laboriosū sagacē. duri p̃positi. nō cito cōuertē-
bilem ad credendum audita.

The pectore.

Ca. lxxiii.

Etus grossum et amplum significat hominem fortis

MICHAEL SCOT (*circa* 1175–1230 A.D.) *was after his lifetime celebrated as a magician. He was tutor and friend of the Emperor Frederick II., for whom he translated Arabic versions of Aristotle's works and the Commentaries of Averroës into Latin. He wrote also a manual upon "Urines" and a work upon the art of "Physiognomy" which was much cultivated at that time. He forms one of the connecting links between the Arab learning and the 13th-century Pre-renaissance of the West.*

Marginal Note in a 13th-century MS. of Scot's Translation of Aristotle's "History of Animals," giving the Clinical Record of a Case (probably a calcified fibroid tumour).

I, Michael Scot, who put this book into Latin, declare that in the year 1221 on the first of November a very noble lady of the State of Bologna who was my hostess, the widow of Albertus Gallus, discreet, noble above other ladies in her town and learned, brought to me a discreet and wise woman named Mary, dwelling in a fine house of the neighbourhood. Mary showed me two stones like eggs. . . . And the stone compared with its bulk was very light, and among all its pores appeared a passage of veins and sinews, and it was whiter on cutting into. And it was possible to cut the stone with a knife, and between the outer layer like an eggshell and the inner pores was, as it were, a meal of powdered chalk, and that stone came from the womb of the said Mary on the first of July of the same year. And on the eighth day of July another stone of the same kind came out and of the same weight according to its bulk, for it was somewhat smaller, of darker colour and compressed on each side. And it seemed to the said Mary that for eight years before the passage of these stones the tumour was constantly lessening somewhat. And on the said stones were no furrows as in stones from the kidneys or bladder; and between the projections were signs of white skin, which you find to be due to its long duration. The said Mary consulted me on account of difficulty in urination.

PHYSIOGNOMY

Chap. 82. ON THE HANDS.—Hands of soft flesh, slender and long, show a man of good intellect but little strength, easily frightened, gladly peaceful, pretty formal, discreetly obliging, of domestic habits, and erudite. Hands that are very thick and short show a man of slow intelligence, simple, vain, lying, strong, hard-working, faithful, credulous, and good-tempered. Hairy hands with strong hair and curved fingers show a man wanton, vain, lying, of slow intelligence, and more simple than wise. Hands with fingers curved backward show a man liberal and obliging, of good strength, sagacious, little envious, wrathful, of good intellect, and moderately secretive. Hands with fingers stiff at the ends show a man persistent, viciously acquisitive, hard-working, sagacious, of set purpose, not quickly persuaded to believe what he hears.

BERNARD DE GORDON (*circa* 1300. A.D.) was Professor in Montpellier from 1285, and wrote the "*Lilium Medicinae*," which was a popular text-book for two centuries. He appears to describe syphilis along with leprosy, and shows much Arabian influence. Tradition reports him to have been of Scotch extraction. (*From a printed edition of 1550.*)

LILIUM MEDICINAE

Par. I. Cap. xxii. DE LEPRO. — Lepros est morbus consimilis corrupens figuram & formam & compositionem membrorum, & finaliter soluens continuum, proveniens de materia melancholica sparsa ad totum corpus. . . . Signa infalibilia sunt ista, depilatio superciliorū & grossities eorum, rotunditas oculorū, dilatatio nariū exterius & coarctatio interius cum difficultate anhelitus, & quasi si cum naribus loqueretur, & color faciei lucidus, vergens ad fuscenedinem mortificatam, & terribilis aspectus faciei cum fixo intuitu, & cū gracilitate contractione pulparū aurium. . . .

Cap. xxiii. DE MORPHEA. — Morphea est cutis defoedatio maculosa. Intelligendum est, quod omnia illa quae sunt causae leproae, sunt causa morphea, unde quod est leproa in carne, est morphea in cute.

Par. II. Cap. xxv. DE EPILEPSIA. — Cū aliquis est in paroxysmo, si aliquis ponit os supra aurē patientis, & dicat ter istos 3 versus proculdubio statim surgit :

*Gaspar fert myrrhum, thus Melchior, Balthasar aurum ;
Haec tria qui secum portabit nomina regum,
Solvitur a morbo Christi pietate caduco.*

DE PROGNOSTICIS. — Modus autem generationis apostematum est iste, cū magnae venae sunt plenae, deinde parvae & capillares ; tunc quia san. in venis contineri non potest aperiuntur violenter orificia venarū, tunc sang. exit & resudat ad porositates membrorum & loca debilia, tunc si san. temperatus est in qualitate & quantitas eius est pauca, & virtus eius est fortis, tunc potest rectificari, aut quandoque assimilando & evaporando sic quod non generabit apostema. Si autem sit nimiae quantitatis aut malae qualitatis tunc non potest corrigi, sed congregatur materia in loco debili & causat apostema. . . . Modus autem generationis apostematis choleri est sicut de sanguine, & ita de aliis humoribus.

BERNARD GORDON'S *Lily of Medicine*

ON LEPROSY.—Leprosy is a disease corrupting the shape and form and the substance of the members, and finally breaking them up, arising from melancholic matter scattered throughout the whole body. . . . The infallible signs are these, loss of hair on the eyebrows and thickening of them, roundness of the eyes, dilatation of the nostrils outwardly and narrowing within causing difficulty in breathing, and as it were speaking by the nostrils, and the colour of the face shining white turning to the darkness of mortification, and a terrible appearance of the face with fixed gaze and with wasting and shrinking of the pulp of the ears. . . .

ON MORPHEA.—Morphea is a spotted impurity of the skin. It must be understood that all those things that are causes of leprosy are causes of morphea, wherefore what is leprosy in the flesh is morphea in the skin.

ON EPILEPSY.—When one is in a fit, if one places the mouth over the ear of the patient, and says thrice these three lines, without a doubt he will forthwith rise up :

(*Charm.*)

ON PROGNOSTICS.—The mode of origin of abscesses is this : the large veins are filled with blood next the small ones, then the hair-like ones ; and because the blood cannot be held in the veins their orifices are opened violently, the blood passes out and sweats at the pores of the members and the weak places ; if the blood is moderate in quality and small in amount, and if its virtue is great, then it may be healed or sometimes through assimilation and evaporation it does not produce an abscess. But if it is of too great quantity or of bad quality, it cannot be put right, but matter collects in the weak place and causes an abscess. . . . But the mode of origin of bile abscess is similar to that of one caused by blood, and so with the other humours.

JOHN OF GADDESSEN (circa 1310 A.D.), physician to Edward III. and Professor of Medicine at Merton College, Oxford, wrote the "*Rosa Anglica Practica Medicinæ a capite ad pedes.*" It is a learned practical work on medicine, well arranged, each disease being dealt with under the heads of Causes, Symptoms, Cure, etc., but it contains many somewhat fatuous prescriptions. He is the reputed prototype of Chaucer's Doctor of Physik. (From an early printed edition of 1492; about two-thirds.)

Noctilupa ē passio

oculorū p quā hōies versus noctē nihil vidēt. 7 dicūt noctilupa qñ nocte lucē pellēs.

Cause Cui⁹ cā sūt grossities spūs 7 humoris q d die subtiliatur 7 vsus noctē igrossat. s. circa horā vespaz. 7 attingit ex hūorib⁹ grossis melācolicis 7 alijs adustis a q b⁹ fumus eleuat⁹ ad oculos eos subfuscās 7 spiritus ificās 7 obtenebrās. 7 iō versus tenebrā icipit. s. versus noctē nō vidēt s; tenebra recedēte spūs icipiūt clarescere digōne ciborū 7 potuūz 7 humorū i sōno ppleta. **Signa** sūt manifesta.

Cura Cura huius morbi ē quatuor res. p⁹ ē regimē vite. 2⁹ est subtractio materiei. 3⁹ est abstractio eius qd fugit. 4⁹ est correctio nocimenti accidētis in spiritu.

¶ p⁹ m⁹ rē pplet qmēsuratō. vj. rez n nāliū 7 ppe alleviatio cōstōis 7 dīmissio cene. 7 sint cibaria digōi obediētia. 7 p⁹ dīcētū cibi a sto⁹ potet vi antiquū bonū puz. 7 mane deē diāthos. deinde deē puluis gar. galāge cinamomi zedoarie cū vino puro bono 7 tunc qescat. deīn comedat illud qd vult. Et ex cibis q currūt cursu pprictatis ē epar capinū vel hircinū assū vel elixū cū salegē ma modicū 7 cū pipere lōgo comestū.

¶ 2⁹ m⁹ rē pplet flo⁹ ex cefalica si sāguis abūdaue rit. 7 ex venis lachrymalib⁹. s. i āgulis oculorū ex teriorib⁹. 7 i narib⁹ ē si necesse fuerit. Si at ex hūorū grossitie fiat: eū fiat cū ierapigra 7 cū ieracoloquitidos 7 cū ieralogodion 7 pillulis cochijs 7 cū gargarismatib⁹ 7 caputpurgijs.

¶ 3⁹ m⁹ rē pplet colliria de fellib⁹ 7 istillatiōes in oculis. 7 maxie illd qd currit ex epate hircio aut caprino qñ scindit i multis ptrib⁹ 7 aspgit super apz salgēma 7 pip lōgū post cōtritōez eoz. deīn assatur cum eisdem spēb⁹ sup prunas. 7 fiat inclinatio sup fumū ei⁹ vel suffumigatio. 7 cōstio ei⁹ iuuat. 7 inclinatio sup vaporē elixatōis eius.

¶ 4⁹ m⁹ rē pplet administratio medicaminū spūm visibilē subtiliātū 7 illustrātū: sicut ē vsus cubebe 7 feniculi 7 kebuli qditi 7 nuēmu. qdite. deīn fiat colliriū tale. R. succi feniculi cocti 7 depurati p. j. mell' 7 fellis hircini vel caprini vel bouini añ. p. c. j. fiat colliriū. adde tñ sterc⁹ lacerte viridis si possit hēri. si nō adde sterc⁹ muris aut caprinū 7 sanabit i paucis dieb⁹. **Atas** sene 7 diasene 7 diaboragiato 7 7 catholicō 7 trisera sara cenica: q ista spūs purificāt 7 mās adustā cūant: 7 p qñs curāt. Itē aq capisolijs curat noctilupā. adez facit aq hedere arborē: q de istis viuūt capre. 7 quicqd ē i capra ēt hēdo valet i cura istius passiōis. tñ caro capre nō v; ad comedē. sed aq decoctōis ei⁹ valet ad fomētā. 7 ad lauā. ocu-

los 7 ad submergē. 7 istud scio ē v; 7 i cecitate sūme v; hēc aqua 7 ābe ēt. Et ista eadez cura valet eis q vidēt d ppe 7 nō d lōge v; ecōuerso: sicut p; ponēdo pila ad cās isti⁹ visōis subtiliādo spūs vel eos igrossādo vel multiplicādo fm q requirit huiusmōi dispō. 7 ideo recurratur ad capla pcedētia p cura vltiori.

Ca de passiōib⁹ palpebrarū p. 2. capla.

p⁹ de inuersione palpebrarum.

2⁹ de verrucis 7 apostemantib⁹ duritie 7 nodositate 7 ordeolo 7 petrificatōe 7 lupia.

3⁹ de puritu palpebrarum.

4⁹ de carne vel carnositate i palpebra vel incoiunctiua oculi.

5⁹ de pediculis in eis.

6⁹ de tumore earum.

7⁹ de pilis iuersatis 7 cadētibus.

8⁹ de difficultate claudēdi palpebras 7 apicēdi.

9⁹ de fistula vlcere 7 sanie in eis.

De inuersione palpebrarū.

Palpebrarū inuersione vel inuersio ē qñ palpebrarū interiora versūt 7 reuertūt vsus exteriora 7 appet eaz rubedo qñ ēt actio pellis extior 7 elōga interior.

Cause Cui⁹ cā ē tardus pot⁹ 7 mult⁹ 7 pauc⁹ sōn⁹: q; ibi fumi idigesti peunt oculos 7 igrossāt iteriora in tñ q extenius eminet. Et attingit ex replone cerebri 7 ex fumo 7 ploratu: q; talia mordicādo 7 fluēdo faciūt materiā ire ad oculos. **Signa** sūt manifesta.

Ozonostica Talis morbi⁹ facit oculos lipposos paratos ad obtalmiā 7 facit patictes abomiabiles corā oī hōie. 7 ipedit visuz d mane diu. 7 ipedit motuz i vcto 7 pluuia q; d facili cā gnātur 7 cito inducit cecitatē nisi remoueat.

Cura Cura requirit tria. cūatōem. regimē in dieta 7 localia remedia. p⁹ m⁹ scz cūatio fit cū elisteri i picipio. deīn cū flobō i brachio. deīn cū flo⁹ i ramo cefalice q ē iter pollicē 7 idicē. s. i radice pollicis. 2⁹. s. dieta d; ē talis sicut dictū ē i capitulis pcedētib⁹. s; maxime valet abstinentia hic a cibo 7 potu. q; hoc i principio curat remotis causis exteriorib⁹. s. vento fumo pluuia vigilia 7 a fletu 7 a puluere 7 c. 3⁹. s. localia remedia fiāt cū lotōe aq i ore retēte mixte cū salua ieiunia mane. deīn cū aqua ro. deīn cū aqua verbene 7 filagis 7 agrimonie. Et si sit ibi lippositas addat aq celidonie vel cetaurce. v; aq capisolijs optima ē 7 ippe. deīn stuphēt oculi cū fumo olibani 7 picis. deīn inūgātur palpebre cū arūgia coturnicis anglice qualie. deīn cum isto

2 vnguēto

ROSA ANGLICA

NOCTILUPA is a disease of the eyes by which men see nothing towards nightfall, and it is called *noctilupa* from *nocte lucem pellens*.

CAUSES of this are a thickening of the mucus and humor which by day are refined, and become thickened towards night, to wit about the hour of evening. And it arises from humors thick, melancholic, and otherwise burned up, from which the fumes arise to the eyes making them dusky, and infecting and darkening the spirit. Thus towards the onset of the dark or towards night they do not see, but, when darkness departs, the mucus begins to clear by digestion of the food and drink and humors completed during sleep. SYMPTOMS are evident.

CURE.—The cure of this disease consists in four things. 1st is the regulation of the life. 2nd is the withdrawal of the cause. 3rd is the removal of that which flows. 4th is the correction of the injury done to the spirit. . . .

2nd. This is effected by phlebotomy of the cephalic vein if there is excess of blood and from the lachrymal veins at the angle of the eyes outside, or in the nostrils if this be necessary. . . . 4th. This is effected by administration of medicines which refine and clear up the visible mucus, as by the use of cubebs and fennel and seasoned kebuli and fir-cones. Prepare and then let this eye-salve be made: R Fennel juice boiled and purified, 1 part; honey, 1 part; buck-, or goat-, or ox-bile 1 part. Make an eye-salve; add then the faeces of a green lizard if it can be had; if not, add the faeces of a mouse or of a goat, and it will be cured in a few days. . . .

[SPASM IN CHILDREN is thus cured. R of lily roots 1 handful, of anise ʒj, of crocus ʒij; let all be ground and mixed with boiled honey and let a plaster first be made. Then let (the child) be bathed with a decoction of these herbs, R of chamomile and melilot of each 1 handful, of fenugreek 5 pounds, let them be boiled in water and made into a bath. And on coming out of the bath, let all the joints be anointed with warmed oil of chamomile, and then let the said plaster be applied. Let not (the child) drink wine nor fill itself to repletion; but older children may, after purgation, drink old wine in small quantity which relieves spasm of this sort.]

GUY DE CHAULIAC (*circa 1290–1370 A.D.*) *was the most distinguished surgeon of the Middle Ages. He studied in Paris, Montpellier, and Bologna, practised most of his life in Avignon, and wrote there his “Surgery” and other works.*

GUIDONIS DE CAULIACO CHIRURGIA

CAP. UNIVERSALE.—Et ego Guido de Cauliaco, chirurgus, magister in medicina . . . vidi operationes multas, & multa scripta praedictorum, praecipue galeni, quia quot reperiebantur libri in utraque translatione habui, et eos cum diligentia qua potui studui, & per multa tempora operatus fui in multis partibus, & nunc eram in Avinione, anno domini millesimo tercentesimo sexagesimo tertio. . . .

TRACT. DE ANATOMIA.—Chirurgi ignorantes anatomiam, peccant multoties in incisionibus nervorum et colligationum.

Tract. VI. Cap. viii. DE MEMBRIS AMPUTANDIS.—Maior est mors totius corporis ut dicit Albuca: quā defectus mēbri. Incidatur ergo, et locus abscissionis ligetur: si corruptio pertingeret usq; prope iuncturā, incidatur in iunctura cū rasorio, et aliis instrumētis, sive serratione. Si autē non est prope iuncturā, sed elōgatur ab ea; incidatur supra corruptū aliquātulū in loco in quo cū tēta intromissa invenit firmitudinē et dolorē. Et serretur os cū subtili serra. Et modus est quod involvatur membrū a parte sana, & a parte corrupta cū ligamentis: & teneatur firmiter per ministros: & separetur caro que est inter duo ligamenta cū rasorio, donec videatur os totaliter a carne liberatū. Et post muniātur labia cum panno, ut nō laedantur a serra. Et tunc serretur os subtiliter, & perfecte & mēbro separato cauterizetur sanum cum ferro ignito ad hoc apto, aut cum oleo ferventi, ut dictū est: et ligetur: et reliqua ulcerū curatione curetur. . . . Nōnulli vero, ut Theodo. medicinas obdormitativas, ut non sentiatur incisio dictant, velut est opiū, succus morellae, hyoscyami, mandragorae, hederæ arboreae, cicutæ, lactucae. Et imbibunt in eis spongiā novā, & permittunt eā ad solem exiccari: & quando erit necesse mittunt illā spongiā in aqua calida, & dant eam ad odorandum tantum usquequo capiat somnū. Et ipso obdormitato faciūt operationem. . . .

Ego autem in tali membri mortificatione intercepta ambulatione corruptionis cum scarificationibus & arsenico & ponendo defensivum super partem sanam de bolo armeno, & aliis opportunis: involvo totum membrum mortificatum cum sparadrapo infrascripto multipliciter: & ligo ipsum: & praeparo suo modo, ut dicetur de corporibus mortuorum servandis. Et sic eum retineo quousque iunctura sit aequiliquata, & membrum per se cadat: quia honestius est medico quod cadat per se, quam si incideretur: semper enim quando inciditur, remanet rancor & cogitatio in patiente quod posset remanere.

GUY DE CHAULIAC'S "SURGERY"

GENERAL CHAPTER.—I, Guy de Chauliac, surgeon, master in medicine . . . have seen many operations and many writings of those I have mentioned, especially of Galen, because I possessed whatever books were found in either translation and studied them with all possible diligence, and I operated long in many regions till now I was in Avignon, in the year of grace 1363. . . .

TREATISE ON ANATOMY.—Surgeons ignorant of anatomy make many mistakes in cutting nerves and ligaments.

Treatise VI. Chap. viii. ON AMPUTATION OF LIMBS.—Death of the whole body is of greater import than the loss of a limb, as Abulcasim says. Therefore let it be cut and the place of amputation be bound. If the gangrene reaches nearly to a joint let the cutting be made at the joint with the knife and other instruments or by sawing. If however it is not near a joint, but at a distance, let the cut be made somewhat above the gangrene at a place where the probe being introduced finds the tissues firm and sensitive. And let the bone be sawn with a fine saw. The method is as follows:—The limb is wrapped round at the healthy part and also at the diseased part with bandages, and is held firmly by assistants; the flesh between the two bandages is divided with the knife until the bone appears completely freed from flesh. Then the surfaces are covered with a cloth that they may not be injured by the saw, the bone is sawn accurately and completely, and the member being separated the healthy part is burned with a glowing iron adapted for the purpose or with boiling oil, as has been said; is bandaged and receives the further treatment proper to ulcers. . . . Now some, like Theodoric, recommend soporific drugs, that the cut may not be felt, like opium, and the juice of morella, henbane, mandrake, ivy, hemlock, and lettuce. They soak a new sponge in these and let it dry in the sun. And when needed they put the sponge in warm water and give it to smell till sleep comes, and the patient having fallen asleep they do the operation. . . .

But I, in such a mortification of a limb after the advance of the gangrene has been stopped by scarifications and arsenic and application of a protective of bolus armenius and other things proper to the sound part, wrap the whole mortified limb many times round with the sticking plaster described later, and bandage it, and I prepare it after the manner mentioned for preservation of the dead. Thus I keep it till the joint is half wasted and the member falls off by itself; because it is more credit to the physician that it should fall off than if it was cut off; for when it is cut there always remains a grudge and a reflection on the part of the patient that it might have been left.

JOHN OF VIGO, *writing about 1500, gave the first description of syphilis as a separate disease. It is a debated question whether the disease simply attracted notice at this period, or whether it had been introduced by followers of Columbus from America discovered in 1492.*

JOANNIS DE VIGO

EX LIBRO QUINTO PRACTICAE CHIRURGICAE.—Anno millesimo quadringentesimo nonagesimo quarto de mense Decembris: quo anno Serenissimus Carolus Francorum Rex magna comitante caterua uersus Italiae partes iter accepit ad regnum Neapolitanum recuperandū, Apparuit quoddam morbi genus quasi per totā Italiam incognitae naturae: quem uariis & diuersis nominibus diuersae nationes appellarunt. Galli utiq; morbū Neapolitanum nominarunt, quia eodem tempore dicunt ipsum morbum Neapoli in Galliam se in suo ipsorum reditu transtulisse. Neapolitani uero quia dicto anno per totam Italiam hic morbus diffusus & manifestatus fuit, ideo morbum Gallicum nuncuparunt. . . . Fuit praeterea, & adhuc est, morbus praefatus contagiosus, praesertim per coitum. . . . Tamen contigit saepenumero ex simplici unctione cum modico argenti uiui roborata predictos dolores, pustulas, ulcerationes, & squallidam scabiem intra hebdomadam, brachia à cubito, & tibias à genu infra liniendo, haud dubie me curasse. . . . Linimenti receptum prius ordinabo nobilissimae operationis, quod & ualet in quocunque tempore huiusmodi morbi, cuius talis est nostra descriptio. Recipe pinguedinis porcinae liquefactae lib. j. olei camomelini anethini ana unc. j. olei masticini, laurini ana unc. j. storacis liquidae drac. x. radicum enulae aliquantulum conquassatae, radicum ebuli ana unc. iiii. squināti, stoecados ana parum, euforbii pisti unc. s. uini odoriferi lib. j. s. bulliant omnia simul usque ad consumptionem uini, deinde colentur, cui colaturae addantur litargirii aurei un. viii. thuris, masticis an. ʒvi. resinae pini un. j. s. tereb. clarae un. j. argenti uiui extincti cum saliuā. unc. iiii. cerae albae unc. j. & s. liquefactis oleis cum cera omnia adinuicem incorporentur, & fiat linimentum.

JOHN OF VIGO

BOOK V. OF PRACTICAL SURGERY.—In the year 1494, the month of December, of the year in which the most serene Charles King of the Franks betook himself towards Italy with a great accompanying host to recover the kingdom of Naples, there appeared a certain kind of disease of unknown nature, as it were throughout Italy: different peoples have called this by various and diverse names. The French certainly called it the “Neapolitan disease,” because they say that the disease itself passed over at the same time as they returned from Naples into France. But the Neapolitans name it the “French disease,” because in the said year this disease was spread and became evident throughout Italy. . . . Besides, the disease mentioned was, and still is, contagious especially by coitus. . . . Yet it frequently happens that I have undoubtedly cured by means of a simple ointment, strengthened with a little quicksilver, the said pains, pustules, ulcerations, and filthy eruption within a week, by smearing the arms from the elbow, and the legs from the knee downward. . . . I shall first set out the recipe for a liniment of most renowned action which is also effective at any period of this disease; this is our description of it. \mathcal{R} Liquefied lard lib. j; oils of chamomile and dill each $\mathfrak{z}\text{j}$; oils of mastich and laurel each $\mathfrak{z}\text{j}$; liquid storax $\mathfrak{z}\text{x}$; roots of enula somewhat bruised, and of dwarf-elder each $\mathfrak{z}\text{iv}$; small woodruff and French lavender each a little; euphorbia $\mathfrak{z}\text{ss}$; scented wine lib. jss. Boil all together till the wine disappears, then strain, add golden litharge $\mathfrak{z}\text{viii}$; frankincense, mastich each $\mathfrak{z}\text{vj}$; pine resin $\mathfrak{z}\text{jss}$; clear turpentine $\mathfrak{z}\text{j}$; quicksilver extinguished with saliva $\mathfrak{z}\text{iv}$; white wax $\mathfrak{z}\text{jss}$. To the oils liquefied with the wax mix in everything in turn and let it be a liniment.

JOHN KAYE *or* CAIUS (1510–1573) *studied at Cambridge and Padua ; he was physician to Edward VI., Mary, and Elizabeth ; was the first Master of Gonville and Caius College ; and wrote on the Sweating Sickness and other subjects.*

THE BOKE OF JHON CAIUS AGAINST THE SWEATYNG SICKNES.

. . . The beginnyng of the disease.—In the yere of our Lorde God M.CCCC.LXXXV. shortly after the vij. daye of august, at whiche tyme kyng Henry the seuenth arriued at Milford in walles, out of Fraunce, and in the firste yere of his reigne, ther chaunced a disease among the people, lastyng the reste of that monethe & all september, which for the soubdeine sharpenes and vnwont cruelnes passed the pestilence. . . . Let vs therfore returne to the thing, which as occasiō & cause serued, came againe in the M.D.VI. the xxii. yeare of the said Kyng Henry the seuenth. Afre that, in the yeare M.D.XVII. the ix. yeare of Kyng Henry the viii., and endured from July vnto ye middest of Decēbre. The iiij. tyme, in the yeare M.D.XXVIII. the xx. yeare of thesaied Kyng, beginning in thende of May, & continuing June and July. The fifth tyme of this fearful *Ephamera* of Englande, and pestilent sweat, is this in the yeare M.D.LI. of our Lorde GOD, and the fifth yeare of our Souereigne Lorde King Edward the sixth, beginning at Shrewesbury in the middest of April, proceadinge with greate mortalitie to Ludlowe, Prestene, and other places in Wales, then to Westchestre, Couentre, Drenfoorde, and other tounes in the Southe, and suche as were in and aboute the way to London, whether it came notablie the seuenth of July. . . .

This disease is not a Sweat onely (as it is thought & called) but a feuer, as I saied, in the spirites by putrefaction venemous, with a fight, trauaile, and laboure of nature againste the infection receyued in the spirites, whervpon by chaunce foloweth a Sweate, or issueth an humour compelled by nature. . . . That it is a feuer, thus I haue partly declared, and more wil streight by the notes of the disease, vnder one shewing also by thesame notes, signes, and short tariance of the same, that it consisteth in the spirites. First by the peine in the back, or shoulder, peine in the extreme partes, as arme, or legge, with a flusshing, or wind, as it semeth to certeine of the pacientes, flieng in the same. Secondly by the grief in the liuer and the nigh stomacke. Thirdely, by the peine in the head, & madnes of the same. Fourthly by the passion of the hart. . . . Wherupon also foloweth a marueilous heauinesse (the fifthe token of this disease), and a desire to sleape, neuer contented, the senses in al partes beynge as they were bounde or closed vp, the partes therfore left heuy, vnliuishe, and dulle. Laste foloweth the shorte abidinge, a certeine Token of the disease to be in the spirites, as wel may be proued by the *Ephmera* that Galene writethe of, whiche because it consistethe in the spirites, lasteth but one natural day.

DESIDERIUS ERASMUS (1466–1536), *while not himself a member of the medical profession, is a Renaissance representative of the old philosophers. He stands as the supreme type of cultivated common sense applied to human affairs, and his appreciation of the medical art (written about 1500) is therefore most valuable.*

ENCOMIUM ARTIS MEDICAE ERASMO AUTORE

Cuius quidem ea vel praecipue laus est, primum quod nullis omnino praeconiis indiget, ipsa abunde per se vel utilitate, vel necessitate commendata mortalibus. . . .

Etenim si quis secum reputet, quam multiplex in corporibus humanis diversitas, quanta ex aetatibus, sexu, regionibus, coelo, educatione, studiis, usu varietas, quam infinita in tot milibus herbarum (ne quid interim dicam de caeteris remediis) quae alibi aliae nascuntur, discrimina. Tum quot sint morborum genera, quae trecenta nominatim fuisse prodita scribit Plinius, exceptis generum partibus, quarum omnium quam nullus sit numerus, facile perpendet, qui tantum norit, quot formas in se febris vocabulum complectatur, ut ex uno caetera aestimantur; exceptis his, qui quotidie novi accrescunt, neque secus accrescunt, quam si de composito cum arte nostra bellum suscepisse videantur. Exceptis venenorum plus mille periculis, quorum quot species sunt, tot sunt mortis genera, totidem remediorum differentias flagitantia. Exceptis casibus quotidianis lapsuum, ruinarum, ruptionum, adustionum, luxationum, vulnerum, atque his consimilium, quae prope cum ipso morborum agmine ex aequo certant. Denique qui cogitet, quanta sit in corporum coelestium observatione difficultas, quae nisi cognoris, saepenumero venenum erit, quod in remedium datur, Ne quid interim commemorem saepe fallaces morborum notas, sive coloris habitum spectes, sive lotii signa rimeris, sive pulsus harmoniam observes, velut hoc agentibus malis, ut hostem medicum fallant et imponant.

Jam auget et illud non levi argumento medicinae gloriam, quod et Caesarearum legum majestas, et pontificiarum autoritas sese ultro medicorum iudicio submittit. . . . Divus item Augustinus ex medicorum consilio fieri iubet, quod faciendum est, etiamsi nolit aegrotus. Idem honorem medico debitum, hoc est artis et industriae praemium, recte eripi scribit ab eo qui detinet, velut ab injusto possessore et quod alienum est mala fide occupante. Quin ii quoque, qui conceptis precaminibus, daemones impios e corporibus humanis exigunt, non raro in consilium adhibent, velut in his morbis, qui secretis rationibus quaedam sensuum organa spiritusque vitiant, et adeo daemoniacam speciem imitantur, ut nisi a peritissimis medicis discerni non queant, sive sunt crassiores aliqui daemones, ut fertur illorum varia natura, qui medicam etiam opem sentiant, sive morbus adeo penitus intimis animi recessibus insidet, ut a corpore videatur alienus. . . .

Vobis igitur magnopere gratulor, eximii viri, quibus contingit in hoc pulcherrimo genere professionis excellere.

Vos adhortor, optimi juvenes, hanc toto pectore complectimini, in hanc nervis omnibus incumbite, quae vobis decus, gloriam, auctoritatem, opes est conciliatura, per quam vos vicissim amicis, patriae, atque adeo mortalium generi non mediocrem utilitatem estis allaturi.

The highest praise of medicine is that she does not need any praise, as she commends herself amply to man by her usefulness, nay by her necessity. . . .

For, if we consider how great a diversity there is in human bodies, arising from difference of age, sex, country, climate, education, profession and habits ; and how infinitely various are the many thousands of herbs (not to speak of other remedies) which grow each in a different place : then how many kinds of diseases there are, the number of which, according to Pliny, who mentions them by name, is three hundred, not taking into account the subdivisions of these kinds, which anybody easily understands to be innumerable who but knows how many varieties are contained in the word fever ; not considering the new diseases that daily arise and grow, as if they were agreed to enter upon war with our science ; not taking into consideration the more than a thousand poisons, each of which causes a different sort of death and so requires a special remedy ; without taking into account such cases of daily occurrence as stumbling, falling, fracture, burning, spraining, wounding and the like, the number of which almost equals that of the diseases ; then if we further consider how difficult it is to observe the heavenly bodies, which the doctor is bound to know lest the remedy he administers should really be poison ; not to speak of the deceptive symptoms of diseases, whether the colour is considered or the signs of the urine are examined or the pulse-beats are observed, as it seems that the diseases are bent on deceiving and imposing upon their enemy, the doctor.

The glory of the art of medicine is enhanced in no small degree by the fact that the sublime imperial and pontifical laws voluntarily submit to the judgment of the physicians. . . . The divine Augustinus also prescribes that a sick person shall, even against his will, be treated according to the doctor's advice, and he justly says that the honour due to the physician, that is the reward for his art and exertion, ought to be compulsorily taken from him who refuses to give it, as from a man who knowingly keeps in his possession the property of another. Even those who expel evil spirits from the human body by means of incantations often consult a physician, for instance about those diseases that disturb the organs of body or mind in a secret manner, which so much appear to result from diabolical influence, that only very able physicians can discern, whether the devils are of the grosser kind (it is well known that there are various kinds of devils), that are liable to medical treatment also, or whether the disease has penetrated into the deepest recesses of the soul, so that it has no connexion with the body. . . .

Therefore, I congratulate you with all my heart, distinguished men, who have the privilege to excel in this beautiful profession.

And you, good youths, I exhort you to apply yourselves to it with all your strength ; to throw all your energies into the study of a science that will procure you honour, glory, dignity, wealth, and by which you, in your turn, will be a more than ordinary blessing to your friends, to your country, nay, to the whole human race.

MONDINO DI LIUCCI (1275–1326), *a Professor of Anatomy in Bologna, reintroduced the study of human anatomy as against the dissection of pigs, and wrote the first original text-book on practical anatomy in the Middle Ages. His little book remained popular for two centuries, and an early printed edition (1513) contains 79 pp.*

INCIPIIT ANATHOMIA MUNDINI. — Quia ut dixit Galienus. septimo terapēticae Methodi auctoritate Platonis. opus in aliqua scientia vel arte traditur tribus de causis. Primo ut quis satisfaciat amicis. Secundo ut exercitetur quis exercitio utilissimo quod est per intellectum. Tertio ut illo remediatur obliuione : que est ex senectute. Hinc est quod his tribus de causis promotus proposui meis scholaribus in medicina quoddam opus componere.

DE ANATHOMIA MATRICIS. — . . . Et propter istas quattuor causas mulier quam anathomizavi anno pterito. s. anno christi. MCCCXV. in mense Januarii maiorem in duplo habuit matricem quam illa quam anathomizavi anno eodem de mense Martii. . . . Et propterea ceteris erat maior matrix Porche quam anathomizavi anno domini MCCCVI. quam unquam videri potuit in femina humana : Potuit tamen esse alia causa quod erat pregnans et habebat in utero xiii porcellos et in ea monstravi anathomiam fetus sive pregnantis quam tibi narrabo.

LEONARDO DA VINCI (1452–1519) *was specially noted for his painstaking work in practical anatomy and his many admirable drawings of dissections. Undoubtedly the early 16th-century medical schools of N. Italy received much stimulus from him. Many of his anatomical sketches, and especially those dealing with the heart and blood-vessels, upon which he busied himself much, are found in the Windsor Castle Collection.*

MONDINO DI LIUCCI

THE BEGINNING OF MUNDINO'S ANATOMY.—Because as Galen says in the seventh book of his Method of Healing, on the authority of Plato, a work in any science or art is propounded for three reasons. Firstly to satisfy one's friends; secondly that one may obtain a most useful exercise, that is by the mind; thirdly that so one may be saved from forgetfulness, which comes with age. Hence it is that, moved by these three causes, I have proposed to put together a certain work in medicine for my scholars.

ON THE ANATOMY OF THE UTERUS.—. . . And for these four causes the woman whom I anatomized in the past year, or A.C. 1315, in the month of January had a uterus twice as large as one whom I anatomized in the month of March in the same year. . . . And because the uterus of a pig which I anatomized in A.D. 1306 was a hundred times larger than it can ever be seen in a human being, there may be another cause, i.e. because it was pregnant and had in the uterus 13 little pigs. In this I showed the anatomy of the foetus or of pregnancy as I shall tell you.

FROM WINDSOR MSS. OF NOTEBOOKS. ÉTUD. ANAT. REC. B. 7 v.—And you who say that it is better to look at an anatomical demonstration than to see these drawings, you would be right, if it were possible to observe all the details shown in these drawings in a single figure, in which, with all your ability, you will not see nor acquire a knowledge of more than some few veins, while, in order to obtain an exact and complete knowledge of these, I have dissected more than 10 human bodies, destroying all the various members, and removing even the very smallest particles of the flesh which surrounded these veins.

ANDREAS VESALIUS (1514–1564), *Professor of Anatomy at Padua, Pisa, Bologna, and Basel, was the most noteworthy of a group of distinguished contemporary anatomists (e.g. Sylvius, Vidius, Eustachius, Falloppius, Varolius) by his publication of a splendidly illustrated book of systematic human anatomy. He was later physician to the Emperor Charles V., and died on a pilgrimage to Jerusalem.*

DE HUMANI CORPORIS FABRICA (Liber VI. Cap. xiii.)

DE UNDECIM MEMBRANULIS QUATUOR ORIFICIORUM CORDIS.
—Ea corpora cordis membranas nuncupamus, quae cordis uasorum radicibus, ipsorum ue exortibus adnata, calore, substantia, crassitie prorsus membranae existunt, materierum regurgitationibus praefectae. Sunt porro hae omnes ex praecipuorum Anatomicorum sententia undecim numero, ac tres quidem singulis trium uasorū orificiis, duae autem duntaxat uno quarto ue adnascuntur. Vena caua, quam primum dextri uentriculi uas esse recensuimus, suas membranas, uti modo subiungam, locatas exigit. . . . Secundum uniuersam eorundem humiliores sedem (quae etiam ut cauae orificii membranularum, crassior duriorq; existit) fibrae seriatim ex illis enascuntur, quae deorsum porrectae, tandem cordis substantiae ad mucronis sinistri uentriculi amplitudinem passim adnascuntur: & quemadmodum in dextro uentriculo fieri diximus, carnea cordis substantia adaugentur stabiliunturq; Caeterum quia membraneus uenalis arteriae circulus in duos tantum processus dirimitur, dissectionis procures duas tantum membranulas ipsius orificio praefici asserunt: quas mitrae episcopali non admodum inepte contuleris, si modo partem caput amplexentem ipsi membraneo circulo, & huius processus anteriori posterioriq; mitrae cacumini assimilaueris.

ANDREAS VESALIUS

ON THE STRUCTURE OF THE HUMAN BODY (Bk. VI. Chap. xiii.)

ON THE ELEVEN LITTLE MEMBRANES OF THE FOUR HEART-OPENINGS.—Those bodies we call membranes of the heart which spring from the roots of the vessels themselves or from their places of origin, and have in heat, substance, and density exactly the constitution of membranes set against the regurgitation of materials. These are, moreover, in the opinion of the best anatomists eleven in number, and three spring from each of the openings of three vessels, while there are only two at the fourth. The vena cava which we have reviewed as being the chief vessel of the right ventricle requires its membranes placed as I shall immediately mention. . . . All along the lower region of the same (which is also rather thick and hard, like that of the little membranes at the opening of the vena cava) fibres arise one by one from them and stretch downward till they are joined here and there all over the edge of the left ventricle; and, as we have said happens in the right ventricle, they are increased and strengthened by the fleshy substance of the heart. But since the membranous circle of the pulmonary vein (left auricle) is divided only into two processes, the leading dissectors claim that two little membranes only are set to command the opening of the same: these you may compare not very inaptly to a bishop's mitre, if only you will liken the part embracing the head to the membranous circle itself, and the processes of this to the front and back peaks of the mitre.

Das Buch von natürlichen Dingen

Von Schwefel.—Roh soll er in die Arzney nicht gebraucht werden allein separiert von *fecibus*, Als dann so ist er ein treffentliche arzney nemlich so er vom *aloepatico* unnd von *mirra* Eliviert wirt Zum andern mal oder zum drittē mal so ist er ein solch Preservatiff in der Pestilēz in *pleuresi*, in allē geschwert und feulung des leibs also so er eingenomēn wirt zu morgen dē er desselbigē tags kein newe kräckheit lest einfallen d' pestilenz *pleuresi*, od' dergleichē and'n geschwern sond'lich mit dē recept gordnet.

Recipe Sulphuris purgati, uncias X. Mirrae Romanae, unciam unam semis. Aloepatici, uncia unam. Croci orientalis, unciam semis. Misce fiat pulvis.

Widerum auch so wissend. So er von vitriol eleviert wirt etlich mal je offter je besser so entpfacht er die *essentiā* vñ die *Spiritus vitrioli* zu jm alsdān so ist er ein preservatiff in allē fiebern un̄ ein Curatiff in allen hustē Alten un̄ newē mehr dān zuschreiben ist oder zu offnē in ein buch er ist auch ein preservatiff in d' fallendē sucht auch ein Curatiff in d' jugēt . . . darüb ich jn bullich lob und in sonderheht hie fürhalt un̄ so es gebürlich wer dē groben büffel doctoren d' Hohenschuln fürzulegen dē grüdt es mocht mit etlichen bogen Papir nit beschrieben werden. Aber das Berlin gehort für dieselbigen sew nit jnen ist lieber die leut werdē frantz lam contract als dē sie gesundt bleiben un̄ wissen un̄ können in doch nit helffen. Darumb so mercken auff dē mineralischen *sulphur*. . . .

Aber dē will ich mit euch allen bezeugen Edel un̄ unedel das alle Doctor nur neben abgehen was der verführer *Galenus*, *Avicenna*, &c. sagen. Das muß also sein unnd sterben auff solche lügen. Also hat sie der Teuffel besessen domit das sie die liebe im nechstē nicht volbringen und also ihr kinder der ewigen verdammuß werden das ist ihr studiern das ist ihr werck auff erden dē sie thundt. Von aller ersten sollen wir suchen das Reich, Aber nit beim Priester noch beim Leviten Sonder beim Samaritaner so wir die barmherzigkeit in uns haben.

Von dem öl des Roten Vitriols.—So wissen nun weiter wie das vom *Colcotar* durch retortisch distillatiō wie dann den Alchimisten bekandt ist vom Vitriol ein öl wirt und geht blutrot un̄ am sauristen das ist nun das öl das die laboranten gesucht haben besser zusein dann der *Spiritus* in den frantzheuten vñ den dann gemelt ist Als dān nicht ist.

THEOPHRASTUS BOMBASTUS VON HOHENHEIM, PARACELSUS (1493–1541), *studied at Basel University, in the mines of Tyrol, and on extensive wanderings. He has the credit of forming a link between the alchemists and medicine whereby new substances came into use, and of revolting from scholastic tradition. His writings are characterized by furious aggressiveness in many instances and by fondness for mysticism in others.*

THE BOOK OF NATURAL THINGS

OF SULPHUR.—It is not to be used raw in physic, but separated from dregs; then it is an excellent physic, especially when it is combined with aloe, hepaticum and myrrh. For the second or third time it is a great preservative in pestilence, in pleurisy, and in all foulness and festers of the body. If it is taken in the morning, on that day it prevents the onset of any new disease, whether pestilence, pleurisy, or any similar disease or foulness. It is particularly ordered in this prescription. (*Prescription*)

Again this is to be known. If it is treated with vitriol several times (the oftener the better), it obtains the essence of the spirit of vitriol. Then it is a preservative from all fevers and a curative in all coughs chronic and acute more than can be described, or published in a book. It is also a preservative in the falling sickness, and a curative during youth. . . . Therefore I praise it justly and consider it here to be a special thing; and if it were fitting to lay the reasons before the coarse cattle of University doctors, this could not be done in many sheets of paper. But this pearl is not for such swine. They would rather have the people sick, lame, and crippled than remaining healthy, and they neither know nor can do anything to help them. Therefore mark well the mineral sulphur. . . .

But this will I demonstrate to you all, noble and ignoble alike, that all doctors only pursue side by side the way which the corruptor Galen, Avicenna, &c., point out. This must be however, and they die in such lies. Therefore the devil has possessed you that you love not your neighbours, and so you become children of everlasting damnation, which is your study and the work you do on earth. Before all things we should seek the Kingdom, but not with Priest nor Levite, but with the Samaritan so that we may have compassion within us.

OF THE OIL OF RED VITRIOL.—Know then how, just as the alchemists were able by distillation in retorts to produce it from *Colcotar*, so from vitriol an oil is produced of blood-red colour and very acid. This is the oil which the workers have thought to be better than spirit in the sicknesses mentioned, but this is not so. [Now it is not necessary to bring to common knowledge the process of preparation, for it depends upon the exercise of good care and upon good instruments. It is acid beyond all other things, nothing more so, and likewise it has a corrosive property. . . . In fine it demands great respect. It is indeed true beyond what I have mentioned that so much soundness is in its composition that it is to be given in all fevers and loss of appetite.]

AMBROISE PARÉ (1510–1590), the “father of modern surgery,” spent most of his earlier life with the French armies in the field. While he quotes constantly from ancient writers, he tests everything by his own experience. His chief contributions to surgery were the soothing treatment for gunshot wounds and the reintroduction of the ligature for common use in stopping haemorrhage.

DISCOURS PREMIER SUR LE FAIT DES HARQUEBUSADES ET AUTRES BASTONS A FEU.—L’an mil cinq cent trente-six, le grand Roy François envoya une grande armée en Piedmont, pour enuillailler Thurin, et reprendre les villes et chasteaux. . . . I’estois en ce temps-là bien doux de sel, parce que ie n’auois encores veu traiter les playes faites par harquebuses : il est vray que i’auois leu en Iean de Vigo, livre premier des *Playes en general*, chapitre 8, que les playes faites par bastons à feu participent de venenosité, à cause de la poudre : et pour leur curation commande les cauteriser avec huile de sambuc, en laquelle soit meslé vn peu de theriaque. Et pour ne failler, parauant qu’user de ladite huile fervente, sçachant que telle chose pourroit apporter au malade extreme douleur, ie voulus sçauoir, premierement que d’en appliquer, comme les autres Chirurgiens faisoient pour le premier appareil, qui estoit d’appliquer ladite huile la plus bouillante qu’il leur estoit possible dedans les playes, avec tentes et setons : dont ie prins hardiesse de faire comme eux. En fin mon huile me manqua, et fus contraint d’appliquer en son lieu vn digestif fait de iaune d’œuf, huile rosat et terebinthine. La nuit ie ne peu bien dormir à mon aise, pensant que par faute d’auoir cauterisé, ie trouuasse les blesses où i’auois failli à mettre de ladite huile morts empoisonnés : qui me fit leuer de grand matin pour les visiter. Où outre mon esperance, trouuay ceux auxquels i’auois mis le medicament digestif, sentir peu de douleur à leurs playes, sans inflammation et tumeur, ayans assez bien reposé la nuit : les autres où l’on auoit appliqué ladite huile, les trouuay febricitans, avec grande douleur, tumeur et inflammation aux enuirs de leurs playes. Adonc ie me deliberay de ne iamais plus brusler ainsi cruellement les pauvres blessés de harquebusades.

Chap. xxii. CONTUSIONS, COMBUSTIONS, ET GANGRENES.—Lors que l’amputation du membre est faite, il est necessaire que quelque quantité de sang s’escoule, à fin qu’à la partie deschargée y suruiennent moins d’accidens, et selon la plenitude et force du malade. Le sang escoulé en quantité suffisante (prenant tousiours indication des forces du malade) il faut promptement lier les grosses veines et arteres si ferme qu’elles ne fluent plus. Ce qui se fera en prenant lesdits vaisseaux avec tels instrumens, nommés Becs de

AMBROISE PARÉ

FIRST TREATISE UPON THE ACTION OF ARQUEBUSES AND OTHER FIRE-ARMS.—In the year 1536 the great King Francis sent a great army into Piedmont, to harass Turin and retake the towns and castles. . . . I was then quite unsophisticated because I had not yet seen wounds made by arquebuses treated: it is true that I had read in John of Vigo's First Book of *Wounds in General*, chapter 8, that the wounds made by fire-arms take on poisoning because of the powder, and for their cure he orders them to be cauterized with sambuc oil in which is mixed a little theriac. And not to err, before using the said boiling oil, knowing that such a thing could inflict extreme pain on the patient, I wished to know, previously to applying it, how the other surgeons did at the first dressing, which was to apply the said oil as nearly boiling as they could within the wounds by tents and setons; then I had the hardihood to do like them. Finally my oil failed, and I was constrained to apply in its place a digestive made from yolk of egg, oil of roses and turpentine. At night I could not sleep quite easy for thinking that through want of cauterization I should find the injured, to whom I had failed to apply the said oil, poisoned to death. This made me rise very early to visit them. Beyond my hope I found that those, on whom I had placed the digestive dressing, felt little pain in their wounds, were devoid of inflammation and swelling, and had passed quite a good night; the others, to whom one had applied the said oil, I found fevered, with great pain, swelling and inflammation around their wounds. Then I resolved never more to burn so cruelly the poor people wounded by arquebuses.

Chap. xxii. CONTUSIONS, BURNS, AND GANGRENES.—When the amputation of the member is done, it is necessary that some amount of blood should run off, to the end that fewer accidents may happen to the part operated upon, and this must be according to the fulness and strength of the patient. The blood having run off in sufficient quantity (taking the indication always from the powers of the patient) it is proper at once to tie the large veins and arteries so firmly that they cease to flow. This will be effected by grasping the said vessels with the instruments called "crow-beaks." . . . With these instruments

PARÉ—*continued*

Corbin. . . . De ces instrumens faut pinser lesdits vaisseaux (qui n'est mal-aisé à faire, parce qu'on voit le sang iaillir par iceux), les tirant et amenant hors de la chair, dans laquelle se sont retirés et cachés soudain apres l'extirpation du membre, ainsi que font toutes autres parties coupées, tousiours vers leur origine. Ce faisant, il ne te faut estre trop curieux de ne pinser seulement que lesdits vaisseaux : pource qu'il n'y a danger de prendre avec eux quelque portion de la chair des muscles, ou autres parties : car de ce ne peut aduenir aucun accident : ains auec ce l'vnion des vaisseaux se fera mieux et plus seurement, que s'il n'y auoit seulement que le corps desdits vaisseaux compris en la ligature. Ainsi tirés, on les doit bien lier auec bon fil qui soit en double.

LES VOYAGES FAITS EN DIVERS LIEUX.—Vn sergent du Chastelet, demeurant prés saint André des Arts, qui eut vn coup d'espée à la gorge au pré aux Clercs, qui coupoit tout en trauers la veine iugulaire externe, subit qu'il fut blessé, posa son mouchoir sur la playe, et me vint trouuer en ma maison : et lors qu'il osta son mouchoir, le sang iaillissoit d'vne grande impetuosité. Subit liay la veine vers sa racine : par ce moyen fust estanché, et guarist graces à Dieu. Et si on eust suiui vostre maniere d'estancher le sang par les cauterés, ie laisse à penser s'il fust guari : ie crois qu'il fust mort entre les mains de l'operateur.

CANONS ET REIGLES CHIRURGIQUES

Vn remede experimenté

Vaut mieux qu'vn nouueau inuenté.

Où il y a contusion,

Procure suppuration.

Au mal de pied, ou iambe, ou cuisse,

Le lit est salubre et propice.

La gangrene qui est ja grande,

Rien que le cousteau ne demande.

Ceux qui sont par labeur bien souuent agités,

Sont exempts de plusieurs sortes d'infirmités.

Il faut tousiours donner au malade esperance

Encore que de mort y ait grande apparence.

PARÉ—*continued*

one must pick up the said vessels (which is easy to do because one sees the blood spurt from them), pulling them and bringing them out of the flesh, in which they are suddenly retracted and hidden after the removal of the member, just as all other cut parts do, always towards their origin. In doing this you need not be too careful to pick up only the said vessels: because there is no danger in grasping with them some part of the flesh of the muscles, or other parts: for from this no accident can result. Also with this the union of the vessels will be effected better and more securely, than if only the bodies of the said vessels were included in the ligature. Thus drawn out one should tie them well with good thread which should be double.

THE JOURNEYS MADE IN VARIOUS PLACES.—A sergeant from the Châtelet, living near St. André-des-Arts, who got, at the Students' Meadow, a sword-cut on the throat that severed the external jugular vein, immediately he was injured put his kerchief on the wound and came to find me at my house: and when he took away his kerchief the blood spouted out with great force. Quickly I tied the vein towards its root, and by this means it was stanchèd and healed, thanks be to God. And if one had followed your method of stanching blood by cauteries, I leave you to think if it would have healed; I believe he would have died in the hands of the operator.

SURGICAL CANONS AND RULES

A remedy tried is worth more than one new found.

Where there is bruising procure suppuration.

For illness of the foot or leg or thigh, bed is healthy and propitious.

Gangrene that is great needs nothing but the knife.

Those who are often hard at work escape many kinds of trouble.

It is right to give the patient always hope, even when there is great likelihood of death.

MICHAEL SERVETUS of Villanueva (1511–1553), theologian, scholar, and physician, edited Ptolemy's Geography, Pagnini's Bible, etc. He gave the earliest account of the pulmonary circulation in his "De Erroribus Trinitatis," and for the theological novelties in this work he was, on the instigation of Calvin, burned at the stake along with almost all the copies of his book. A copy preserved in Edinburgh University Library is said to have belonged to Calvin.

DE TRINITATIS ERRORIBUS (p. 170)

Ad quam rem est prius intelligenda substantialis generatio ipsius vitalis spiritus, qui ex aere inspirato & subtilissimo sanguine cōponitur & nutritur. Vitalis spiritus i sinistro cordis vētriculo suā originē habet, invātibus maxime pulmonibus ad ipsius generationem. Est spiritus tenuis, caloris vi elaboratus, flavo colore, ignea potentia, ut sit quasi ex puriori sanguine lucidus vapor, substantiam in se continens aquae acris & ignis. Generatur ex facta in pulmonibus mixtione inspirati acris cū elaborato subtili sanguine, quē dexter vētricus cordis sinistro communicat. Fit autem cōmunicatio haec, non per parietem cordis, mediū, ut vulgo creditur. Sed magno artificio a dextro cordis ventriculo, longo per pulmones ductu, agitatur sanguis subtilis a pulmonibus praeparatur, flavus efficitur: & a vena arteriosa in arteriam venosam transfunditur. Deinde in ipsa arteria venosa inspirato aeri miscetur, & expiratione a fuligine repurgatur. Atque ita tandem a sinistro cordis ventriculo totum mixtum per diastolem attrahitur, apta supplelex, ut fiat spiritus vitalis.

Quod ita per pulmones fiat cōicatio & praeparatio, docet cōiunctio varia & cōicatio venae arteriosae cū arteria venosa ī pulmonibus. Cōfirmat hoc magnitudo insignis venae arteriosae, quae nec talis, nec tāta facta esset, nec tātā a corde ipso vim purissimi sanguinis in pulmones emitteret, ob solū eorū nutrimentum, nec cor pulmonibus hac ratione serviret: cū praesrtim antea in embryone solerent pulmones ipsi aliunde nutriri, ob membranulas illas, seu valvulas cordis, usque ad horā nativitatis nōdū apertas, ut docet Galenus. Ergo ad alium usum effunditur sanguis a corde in pulmones hora ipsa nativitatis, & tā copiosus. Itē, a pulmonibus ad cor non simplex aer, sed mixtus sanguine mittitur, per arteriam venosam: ergo in pulmonibus fit mixtio. Flavus ille color a pulmonibus datur sanguini spirituosus, non a corde. In sinistro cordis ventriculo non est locus capax tantae & tam copiosae mixtionis, nec ad flavum elaboratio illa sufficiens. Demum paries ille medius, cum sit vasorum & facultatum expers, non est aptus ad communicationē & elaborationē illam, licet aliquid resudare possit. Eodem artificio, quo in hepate fit transfusio a vena porta ad venam cavam propter sanguinem, fit etiam in pulmone transfusio a vena arteriosa ad arteriam venosam propter spiritum. Si quis haec conferat cum iis quae scribit Galenus lib. 6 & 7 de usu partium, veritatem penitus intelliget, ab ipso Galeno non animadversam.

MICHAEL SERVETUS

ON ERRORS AS TO THE TRINITY

For this purpose we must first understand the substantial generation of the vital spirit itself, which is compounded of, and nourished by, air breathed in and the most subtle blood. The vital spirit has its origin in the left ventricle of the heart, the lungs chiefly assisting in its generation. It is a fine spirit, prepared by the power of heat, of reddish colour, and fiery power, as it were a clear vapour from the purer blood, having in it the essence of water, air, and fire. It is produced from a mixture made in the lungs of breathed air with the subtle part of the blood, which the right ventricle of the heart communicates to the left. Now this communication does not take place through the septum of the heart, as is commonly supposed, but by wonderful mechanism this subtle blood is driven from the right ventricle, by a long course through the lungs; it is worked on by the lungs and made ruddy and is poured from the pulmonary artery into the pulmonary vein. Then it is mixed in this pulmonary vein with breathed air and freed from sooty matter by expiration. So at length the whole mixture is drawn in by the left ventricle through diastole, and the preparation is complete for the spirit to become vital.

That the communication and preparation take place thus through the lungs is shown by the varied joining and communication of the pulmonary artery with the vein in the lungs. The great size of the pulmonary artery confirms this, for it would not be so large, and would not send such a stream of the purest blood from the heart into the lungs, merely for their nourishment, nor would the heart be a slave to the lungs for this reason, chiefly because the lungs in the embryo are otherwise nourished, since those membranes or valves of the heart are not open up to the hour of birth, as Galenus says. So the blood is poured from heart to lungs at the very hour of birth in such quantities for another purpose. Likewise it is not air simply but air mixed with blood that is sent from lungs to heart through the vein-like artery. Therefore the mixture takes place in the lungs, the ruddy colour is given to the vital blood by the lungs not by the heart. In the left ventricle of the heart there is no room for such an abundant mixture, nor would preparation there be sufficient for the ruddiness. Lastly, the septum, void of vessels and properties, is not suited for the communication and preparation, though there may be some soaking through it. By a mechanism like that by which transfusion from the "vena portae" to the "vena cava" takes place in the liver for the sake of blood, transfusion takes place in the lung also from the pulmonary artery to the vein, for the sake of the spirit. If any one compares this with what Galen writes in books 6 and 7 "De usu partium," he will clearly see the truth, of which even Galen was ignorant.

WILLIAM HARVEY (1578–1657) *studied at Cambridge and Padua, practised in London and at Oxford, was physician to James I. and Charles I. He published several important scientific works; of these the most celebrated is the “Exercitatio Anatomica,” in which he gave the first complete demonstration of the circulation of the blood. It is a small book of 72 pp. published in 1628.*

EXERCITATIO ANATOMICA, DE MOTU CORDIS ET SANGUINIS IN
ANIMALIBUS

Cap. I.—Cum multis viuorum dissectionibus (uti ad manum dabantur) animum ad obseruandum primū appuli; quo cordis motus vsum, & vtilitates in animalibus per autopsiam, & non per libros aliorumque scripta inuenirem: Rem arduam plane, & difficultatibus plenam cōtinuo reperi, vt (cum Fracastorio) motum cordis soli Deo cognitum fuisse, penè opinarer. . . .

Cap. IX. . . . Supponamus (vel cogitatione vel experimento) quantum sanguinis, sinister ventriculus in dilatatione (quum repletus sit) contineat siue $\bar{z}ij$, siue $\bar{z}iij$, siue $\bar{z}js$ ego in mortuo reperi vltra, $\bar{z}ij$. Supponamus similiter, quanto minus in ipsa contractione, vel quātum sese contrahat cor, & quanto minorem ventriculus capacitatem habeat in ipsa contractione, vel ipsis contractionibus, quantum sanguinis in arteriam magnam protrudat: (protrudere enim aliquid semper & ante demonstratum est Cap. 3. & omnes in Systole fatentur, ex fabrica valuularum persuasi) & verisimili coniectura ponere liceat, in arteriam immitti partem vel quartam vel quintam vel sextam, & minimum octauam.

Ita in homine, protrudi singulis cordis pulsibus supponamus vnciā semis, vel drachmas tres vel drachmam vnam sanguinis, quae propter impedimentum valuularum in cor remeare non potest.

Cor vna semihora plusquam mille pulsus facit imo in aliquibus, & aliquando bis, ter, vel quater mille. Iam multiplicatis drachmis, videbis una semihora aut millies drachmas tres, vel drachmas duas, vel uncias quinquies centum, aut talem aliquam proportionatam quantitatem sanguinis, per cor in arterias transfusam, maiori semper copia vniuerso corpore contingat reperiri. . . .

Cap. XIV.—Iam denique nostram de circuitu sanguinis sententiam ferre, & omnibus proponere liceat.

Cum haec confirmata sint omnia, & rationibus & ocularibus experimentis, quod sanguis per pulmones & cor, pulsu ventriculorum pertranseat, & in vniuersum corpus impellatur, & immittatur, & ibi in venas & porositates carnis obrepat, & per ipsas venas vndique de circūferentia ad centrum ab exiguis venis in maiores remeet, & illinc in venam cauam, ad auriculam cordis tandem veniat, & tanta copia, tanto fluxu, refluxu, hinc per arterias illuc, & illinc per venas huc retro, vt ab assumptis suppeditari non possit, atque multo quidem maiori (quā sufficiens erat nutritioni) prouentu. Necessarium est concludere circulari quodam motu in circuitu agitari in animalibus sanguinem; & esse in perpetuo motu, & hanc esse actionem siue functionem cordis, quam pulsu peragit, & omnino motus & pulsus cordis causam vnam esse.

WILLIAM HARVEY

ANATOMICAL EXERCISE ON THE MOTION OF THE HEART AND BLOOD IN ANIMALS

Cap. I.—When first I applied my mind (as opportunity offered) by vivisections in order to find out for myself, instead of by the books and writings of others, the object and uses of the heart-movements in animals, I found the matter so apparently hard and constantly beset with difficulties that I almost believed (with Fracastorius) the motion of the heart could be understood by God alone.

Cap. IX. . . . Let us assume (either arbitrarily or experimentally) how much blood the left ventricle holds in dilatation (when it is full), whether 3, 2, or $1\frac{1}{2}$ ounces—in a corpse I have found over 2 ounces. Let us assume further how much less in size the heart is, or how much it shrinks when it contracts, and how much less capacity the left ventricle then has, and how much blood it projects into the aorta (for that it projects something every time both was demonstrated already in Chap. 3, and is admitted by everybody, convinced thereof by the structure of the valves); and we may suppose, as quite near the truth, that one fourth or one fifth or at least one eighth is driven into the artery. Thus in man we may suppose there is projected at every beat of the heart half an ounce, or three drachms, or one drachm of blood, which because of the resistance offered by the valves cannot return into the heart. The heart in half an hour makes at least 1000 beats, and sometimes 2000, 3000, or 4000. Now, multiplying the number of drachms, you will see that in half an hour there are either 3000 drachms or 2000 drachms or 500 ounces; or that some such proportionate quantity of blood is poured through the heart into the arteries; a greater quantity in every case than may be found in the whole body!

Cap. XIV.—Now I may offer my opinion on the circulation of the blood and suggest its general adoption.

Since all these things have been proved, both by reason and ocular demonstration—that the blood passes through lungs and heart by the beating of the ventricles, and is driven and distributed all over the body, where it finds a hidden way into the veins and pores of the flesh, and that it returns by the same veins on all sides from the periphery to the centre from the small veins into the larger ones, then into the vena cava, and so arrives at the auricle of the heart, and in such quantity with so great a flow and ebb, hence by the arteries and hither by the veins, that it cannot be furnished from the materials absorbed (and indeed it is a far greater supply than suffices for nutrition); it is a necessary conclusion that the blood in animals is driven with a kind of circular motion; that it is in ceaseless movement; that this is the action or function of the heart performed by its pulsation; and that the movements and pulsations of the heart are its sole and only cause.

MARCELLO MALPIGHI (1628–1694) *was Professor of Anatomy at Pisa, Messina, and Bologna; he was one of the earliest microscopists and may be called the founder of histology. He first described the minute structure of the kidneys, spleen, cerebral cortex, etc.*

DE RENIBUS. Cap. II.— . . . Aliud etiam, quod additur, totam renum hanc portionem absolute fibrosam esse, nihilque praeter hanc, exceptis sanguineis vasis, adesse, multum difficultatis habet: nam in singulis renibus, quos hucusque ad manus habere potui, glandularum minimarum proventum deprehendi, hoc in quadrupedibus, in testudinibus, & in homine ipso semper mihi accidit observare. Ut autem hae facillime innotescant, injiciendus est niger liquor spiritui vini commixtus per arteriam emulgentem, ita ut turgeat totus ren, & exterius denigretur, nam nudis etiam oculis, ablata renum membrana, illico occurrunt bifurcatis hinc inde arteriis appensae nigro & ipsae colore infectae glandulae; & secto per longum eodem rene, inter vasorum urinae fasciculos & enata etiam interstitia innumeras fere easdem observabis, quae sanguineis vasis atro liquore turgidis in speciosae arboris formam productis, veluti poma appenduntur.

ANTONI VAN LEEUWENHOEK (1632–1723), *a clerk at Delft, was the earliest to employ the microscope for medical discovery. He observed the capillary circulation, the fibres of the lens, the striping of muscle, spermatozoa, the cells of the epidermis, some large bacteria, etc. Most of his discoveries were communicated in 112 papers to the Royal Society of London.*

DEN WAARAGTIGEN OMLOOP DES BLOEDS, als mede dat de Arterien en Venae gecontinueerde bloedvaten zijn, klaar voor de oogen gestelt. Verhandelt in een Brief, geschreven aan de Koninklijke Societeit tot Londen, van den 7 September 1688.

. . . Soo wy dan nu seer naakt voor onse oogen sien dat het overgaan van het bloet uyt de Arterien in de Venae, in de Kikvors-worm, in geen andere bloet-vaten geschiet, als in soodanige die soo dun sijn, dat maar een enkel deeltje bloet te gelijk kan doorgestoten werden; soo kunnen wy nu wel vaststellen, dat het selve in onse lighamen, en in alle Dieren op soodanigen manier werd te weeg gebragt.

. . . Ik hebbe voor desen geseit, dat de delen of globulen van het bloet, die het selvige root maken, soo klein syn, dat thien hondert duysent deelen of globulen, soo groot niet en sijn, als een grof sand is: en over sulks kunnen wy ons wel inbeelden, de hoekleinheid van de bloetvaten waar in den ommeloop geschiet. . . .

Als ik een weinig ter sijden van dese Arterien na de buytekant van de staart af sag, ontdekten ik aldaar twee groote Vena, die het bloet weder opwaarts na het Hert voerden; ende daar benevens sag ik dat in dese groote Vena uyt verscheide kleyne Venae het bloet wierd ingestort. In 't kort, ik sag hier myn volkome vergenoeginge ontrent den ommeloop van het bloet, alsoo my in 't minste niets voorquam waar aan ik behoefde te twijfelen.

MARCELLO MALPIGHI

ON THE KIDNEYS. Chap. II.—An additional statement too that the whole of this part of the kidneys is quite fibrous, and that nothing else, save blood-vessels, is present, presents much difficulty: for in every kidney that has so far come into my hands it has always happened that a number of the minutest glands (*Malpighian bodies*) were detected, and this I observed in quadrupeds, tortoises, and in man himself. But in order that these may be most easily recognized, a black fluid mixed with spirit of wine should be injected through the nutrient artery till the whole kidney swells and the outside becomes black, for even to the naked eye when the membrane of the kidney is removed the little glands appear directly hanging here and there from the divided arteries and themselves stained with the black colour; and when the same kidney is cut lengthwise you will see, between the bundles of urinary vessels and the spaces produced, the same little glands in almost countless numbers, which are hung like apples upon the blood-vessels swollen with black liquid and extended into the form of a sort of tree.

ANTONY VAN LEEUWENHOEK

(*Translation of Nederlandsch Tijdschrift voor Geneeskunde*)

THE TRUE CIRCULATION OF THE BLOOD, and also that the Arteries and Veins are continued Blood-Vessels, clearly set forth. Described in a letter written to the Royal Society of London, of the 7th September 1688.

. . . If now we see clearly with our eyes that the passing of the blood from the arteries into the veins, in the frog-worm, only takes place in such blood-vessels as are so thin that only one corpuscle can be driven through at one time, we may conclude that the same thing takes place in the same way in our bodies as well as in that of all animals.

. . . I have said before that the corpuscles or globules that make the blood red are so small that ten hundred thousand of them are not so big as a grain of coarse sand, and so we can easily imagine how very small the blood-vessels are in which the circulation of the blood takes place. . . .

When I looked at the part of the tail beside these arteries on the outside, I discovered there two large veins, which carried the blood back again to the heart, and moreover I saw that blood was driven into this large vein from several small veins. In short, I saw here the circulation of the blood to my perfect satisfaction, because there was nothing, though ever so slight, that caused me any doubt.

HERMANN BOERHAAVE (1668–1738) *studied in and was later Professor of Botany, Medicine, and Chemistry at Leyden. Though he wrote comparatively little he became the most celebrated physician and medical teacher of the 18th century, and was sought by great numbers of patients and students from all over Europe. His two chief works were the “Institutes of Medicine” and the “Aphorisms.”*

DE USU RATIOCINII MECHANICI IN MEDICINA (MDCCIII)

. . . Depingitur ille, ducendis studii Medici primis lineamentis incumbens, tanquam affixus Geometricae contemplationi figurarum, Corporum, Ponderum, Velocitatis, Fabricae Machinarum, et, quae inde oriuntur in alia corpora, Virium.

His dum mentem exercet, claro discit praecepto et exemplo, liquida ab obscuris, a falsis vera secernere, et ipsa judicandi tarditate animo conciliare prudentiam . . .

Oculum ibi Geometriae luce acutum ad incisa cadavera, ad spirantium corpora brutorum aperta tacitus circumfert. . . .

Aliorum certe durissimo parta labore inventa in suos usus dum accommodat, claram sibi sistit humanae fabricae imaginem. Cui fluidorum vitalium nectit notitiam; hanc Anatomicis, Chemicis, Hydrostaticis, ipsiusque microscopii adjumentis in vivo corpore, ex extra illud examinat. . . .

Hic incisa, quorum notaverat morbos, ruspatur cadavera; illic in brutis arte factas aegritudines observat; nunc eadem ex optimis Auctoribus addiscens; tandem cuncta digerens, expendensque inter se componit, et his, quae Theoria demonstravit, comparat, unde historiam denique curationemque morborum firmet.

En vobis ultima manu absolutam consummati Medici imaginem!

INSTITUTIONES MEDICAE

986. Respiratio magna & rara denunciat cerebrum obstructum, atque morbos inde factos, futurosve; ut sunt coma, lethargus, deliria, &c.

999. Urina rubra, absque sedimento, in morbis acutis, docet 1. motum validum attritus inter partes humorem constituentes, inter vasa & humores. 2. intimam & tenacem permixtionem olei, salis, terrae, aquae, in humoribus. 3. hinc ergo cruditatem magnam morbi. 4. longam futuram durationem ejus. 5. & magnum in eo periculum.

APHORISMI DE COGNOSCENDIS ET CURANDIS MORBIS

617. Symptomata ex febre acuta singulari orta imprimis haec sunt: frigus, tremor, anxietas, sitis, nausea, ructus, vomitus, debilitas, calor, aestus, siccitas, delirium, coma, pervigilium, convulsio, sudor, diarrhoea, pustulae inflammatoriae.

1196. Si ulcus pulmones excederit ita, ut totus inde habitus Corporis consumatur, Phthisis Pulmonalis aegrum afficere dicitur.

1197. Cujus ulceris origo deducitur ab omni causa, quae valet sanguinem in pulmonibus ita sistere, ut in materiem purulentam abire cogatur.

HERMANN BOERHAAVE: ON THE USE OF THE MECHANICAL
METHOD IN MEDICINE (1703)

I imagine a man applying himself to study the first principles of medicine, taken up, as it were, with a geometrical consideration of figures, bodies, weights, speed, construction of machines, and the forces which these produce in other bodies.

While exercising his mind thus, he learns by precept and example how to distinguish clearly the evident from the obscure, the false from the true, and by his very slowness in forming opinions to gain mental balance. . . .

With a vision now cleared by the light of geometry he silently takes in the lessons from dissected bodies and from living animals opened to his gaze. . . .

Indeed whilst adapting to his own use things accomplished and discovered only by the hardest labour of others, he builds for himself a clear idea of the human frame. To this he adds a knowledge of the vital fluids ; and tests it in the living person and his excretions by the aids of anatomy, chemistry, hydrostatics, and even of the microscope. . . .

Now he opens and explores the bodies of those whose maladies he has noted ; now he studies the diseases he induces upon animals ; again he groups together all the results of diseases and of remedies he has tried ; again he learns the same things from the best authors ; finally, arranging and pondering, he adjusts all things to one another, and, by the means which Theory has shown, he obtains at length a certain grasp of the history and cure in each disease.

See then before you the finished picture of the perfect doctor !

INSTITUTES OF MEDICINE

986. Respiration that is deep and infrequent points to a blockage of the brain and diseases that have thus arisen or will arise, like coma, lethargy, delirium, &c.

999. Urine that is red but devoid of sediment, in acute diseases teaches (1) a strong movement of inflammation between the constituent parts of a body-fluid, or between vessels and fluids ; (2) an intimate and firm union of oil, salt, earth and water with these fluids ; (3) hence therefore great overloading in the disease ; (4) a duration of long prospect ; (5) and great danger therein.

APHORISMS ON THE DIAGNOSIS AND CURE OF DISEASES

617. The symptoms of an acute special fever are particularly these : coldness, shivering, anxiety, thirst, nausea, eructation, vomiting, weakness, warmth, flushing, dryness, delirium, coma, sleeplessness, convulsion, sweating, diarrhoea, and inflammatory rash.

1196. If an ulcer of the lungs has so advanced that the whole quality of the body is thence consumed, consumption of the lungs is said to affect the patient.

1197. The origin of this ulcer is traced from any cause which can so stop the blood in the lungs that it is forced to change into purulent material.

GIOVANNI BATTISTA MORGAGNI (1682–1771) *was Professor of Anatomy at Padua and founded the science of Pathological Anatomy. He recorded his discoveries in this field in five books which did a great deal for the orderly classification of diseases.*

DE SEDIBUS ET CAUSIS MORBORUM PER ANATOMEN INDAGATIS.

Lib. I. Ep. iv.—Cum celebrem illam apoplexiae divisionem in sanguineam et serosam non improbandam esse scripsimus in earum quas ad te misimus, epistolarum secunda, minime nos fugiebat, quid viros cum inter veteres, tum inter recentiores doctissimos ab agnoscenda serosa apoplexia contineret. Nec vero nos ii sumus, qui, quotiescunque intra apoplectici calvariam aqua invenitur, continuo ab hac ejus morbum repetendum esse existimemus.

Lib. III. Ep. xli.—Juvenis agricola, cujus duo fratres et ipsi juvenes annis superioribus ex acutis morbis circa vernalium aequinoctium interierant, eodem anni tempore ad hunc modum decessit. Scabiem sibi, nescio quo adhibito unguento, abegerat, paulo post urina suppressa est, non sine vomitu et dolore interdum ad lumbum sinistrum. Urinam tamen aliquoties postea excrevit, sed paucam et saturati lixivii similem et cum dolore, cujus exitum cathetere expedire nequidquam tentatum est. Tandem corpus universum intumuit, et accedente laboriosa ac magna respiratione postridie, circa vigesimum primum a suppressione diem mors ingruit.

Vesica et renes sani erant, nisi quod hi aliquanto majores, illa autem libras continebat circiter duas urinae ejusmodi, qualem diximus. Sed et in ventris cavo humor stagnabat, urinam olens, ceterum limpidae aquae similis. Qui in vitreo vase asservatus, multa divulsa quasi urinarum contenta exhibuit. Igni autem impositus, primum turbidus est factus et vaccini seri consimilis, mox lactis ipsius, denique sic concrevit, ut ovi albumen prorsus referret, cujus modi concretionem in nullo morbido humore, qui in corpore stagnaret, unquam antea Valsalva viderat.

ON THE SEATS AND CAUSES OF DISEASES INVESTIGATED
BY ANATOMY

Lib. I. Letter iv.—When we wrote in the second of those letters which we sent you that the celebrated division of apoplexy into sanguineous and serous (types) is not to be rejected, the reason was far from escaping us which prevented the men alike among ancients and the more modern of the very learned from acknowledging a serous apoplexy. Nor yet are we like those who whenever water is found within the skull of an apoplectic constantly suppose that his disease is to be referred to this.

Lib. III. Letter xli.—A young farmer, whose two brothers themselves young men had died of acute diseases about the spring equinox in previous years, passed away at the same time of year in this fashion. He had got rid of a scurf by applying to himself I know not what ointment; a little after the urine was suppressed with vomiting and pain now and then in the left loin. Yet he passed urine several times afterwards though in small amount, like dark lye, and with pain. Attempts to draw it off by catheter were fruitless. At length the whole body swelled up and the following day, deep laboured breathing coming on, death assailed him about the twenty-first day from the suppression.

Bladder and kidneys were healthy, except that the latter were rather large and the bladder held about two pounds of urine such as we have described. But in the cavity of the belly a humour was collected, smelling of urine and like clear water. This when preserved in a glass vessel showed many fragments as if they were retained from the urine. And set on the fire it became first turbid and like whey, then like milk, and at length so congealed that it straightway produced white of egg, in such a manner as Valsalva had never before seen a condensation in any morbid humour collected in the body.

PERCIVALL POTT (1713–1788) *was one of the most noted of several distinguished surgeons of the English School in the 18th century, e.g. Cheselden, Monro, and William and John Hunter. He made many permanent contributions to surgical knowledge on such subjects as fracture of the leg, injuries of the head, hernia, and disease of the spine.*

ON PALSY OF THE LOWER LIMBS, WHICH IS FREQUENTLY FOUND TO ACCOMPANY A CURVATURE OF THE SPINE.—From an attentive examination of these morbid appearances, and of their effects in different subjects, and under different circumstances, the following observations, tending not only to illustrate and explain the true nature of the disease in question, but also to throw light on others of equal importance, may, I think, be made.

1. That the disease which produces these effects on the spine, and the parts in its vicinity, is what is in general called the scrophula; that is, that same kind of indisposition as occasions the thick upper lip, the tedious obstinate ophthalmy, the indurated glands under the chin and in the neck, the obstructed mesentery, the hard dry cough, the glairy swellings of the wrist and ancles, the thickened ligaments of the joints, the enlargement and caries of the bones, &c. &c. &c.

2. That this disease, by falling on the spine, and the parts connected with it, is the cause of a great variety of complaints, both general and local.

12. That this kind of caries is always confined to the bodies of the vertebrae, seldom or never affecting the articular processes.

16. That what are commonly called lumbal and psoas abscesses, are not infrequently produced in this manner, and therefore when we use these terms, we should be understood to mean only a description of the course which such matter has pursued in its way outward, or the place where it makes its appearance externally, the terms really meaning nothing more, nor conveying any precise idea of the nature, seat, or origin of a distemper subject to great variety, and from which variety its very different symptoms and events, in different subjects, can alone be accounted for.

17. That contrary to the general opinion, a caries of the spine is more frequently a cause than an effect of these abscesses.

23. That when two or more vertebrae are affected, forming a large curve, however perfect the success may be with regard to the restoration of health and limbs, yet the curvature will and must remain, in consequence of the union of the bones with each other.

24. That the useless state of the limbs is by no means a consequence of the altered figure of the spine, or of the disposition of the bones with regard to each other, but merely of the caries : of this truth there needs no other proof, than what may be drawn from the cure of a large and extensive curvature, in which three or more vertebrae were concerned : in this the deformity always remains unaltered and unalterable, notwithstanding the patient recovers both health and limbs.

LEOPOLD AUENBRUGGER (1722–1809), *a Viennese physician, introduced the method of examining the chest by percussion (1761), verifying his observations by post-mortem examination.*

LEOPOLDI AUENBRUGGER INVENTUM NOVUM

I. Thorax sani homini sonat, si percutitur. II. Sonus, quem thorax edit, talis observatur, qualis in tympanis esse solet, dum panno vel aliò tegmine ex lana crassiori facto, oblecta sunt. . . . IV. Percuti, verius pulsari thorax debet adductis ad se mutuo, & in rectum protensis digitorum apicibus lente, atque leniter. V. Thoraci supertensum sit indusium, vel manus percutientis chirotheca (modo ex pollito corio non sit) muniatur. VI. Hominem, cujus thoracem percutere voles, primo in naturali respiratione permittite; jube dein, ut aërem inspiratum retineat. Variabilis occurrens percepti soni mutatio, sub inspirato, expirato, & retento aëre, plurimam utilitatem habet, ad ferendum judicium. . . . XI. Si igitur ex praedictis locis sonoris non percipitur sonus manifestus, utrique lateri aequalis, eidemque percussionis intensitati conformis, morbosum quid in pectore latere significat. . . . XII. Si in aliqua thoracis parte sonora eadem intensitate percussa sonus altior; morbosum ibi subesse notat, ubi altitudo major. XIII. Si in aliqua thoracis parte sonora sub eadem intensitate percussa sonus obscurior: morbus in obscurius sonante loco haerebit. . . . Multorum hoc morbo defunctorum cadavera aperui; & inveni semper pulmones pleurae firmiter accretos: lobum vero ex latere non sonante callosum induratum, plus minusve purulentum.

R. T. H. LAËNNEC (1781–1826), *an army-surgeon and later physician at the Hospital Necker in Paris and Professor of Medicine to the*

TRAITÉ DE L'AUSCULTATION MÉDIATE

BRUIT RESPIRATOIRE PULMONAIRE.—Si l'on applique sur la poitrine d'un homme sain le stéthoscope dégarni de son obturateur, on entend, pendant l'inspiration et l'expiration, un murmure léger mais extrêmement distinct, qui indique la pénétration de l'air dans le tissu pulmonaire et son expulsion. Ce murmure peut être comparé à celui d'un soufflet dont la soupape ne ferait aucun bruit, ou mieux encore à celui que fait entendre à l'oreille nue un homme qui, pendant un sommeil profond, mais paisible, fait de temps en temps une grande inspiration.

. . . Le râle *crépitant humide* est un bruit que se passe évidemment dans le tissu pulmonaire. On peut le comparer à celui que fait du sel que l'on fait décrépiter à une chaleur douce dans une bassine, à celui que donne une vessie sèche que l'on insuffle, ou mieux encore à celui que fait entendre le tissu d'un poumon sain et gonflé d'air que l'on presse entre les doigts: il est seulement un peu plus fort que ce dernier; et, outre la crépitation, il porte avec lui une sensation d'humidité bien marquée. . . . Il est le signe pathognomonique de la péripneumonie au premier degré; il cesse de se faire entendre dès que le poumon a acquis la dureté hépatique, et reparaît lorsque la résolution se fait.

I. The chest of a healthy man sounds, if it is struck. II. The sound which the chest gives out is noticed to be like that usual in drums when covered with a cloth or other covering of rather coarse wool. . . . IV. The chest should be struck or rather beaten slowly and gently with the points of the fingers brought all together and stretched straight out. V. A covering may be drawn over the chest, or the hand of the percussor may be furnished with a glove (but it must not be of smooth leather). VI. Allow the man whose chest you wish to percuss, first to take a natural breath; then tell him to keep in the air. The varying change in sound perceived on breathing in, breathing out, and holding the breath, has the greatest use in forming a judgment. . . . XI. If therefore a distinct sound is not perceived in the places mentioned as resonant, if it is not equal on the two sides though the force of percussion is the same, it means some disease in the side of the chest. . . . XII. If in some resonant part of the chest struck with the same force the sound is of higher pitch, it indicates that some disease underlies the place of higher pitch. XIII. If in some resonant part of the chest struck with the same force the sound is more muffled, disease will lurk in the more muffled-sounding place. . . . I have opened the bodies of many dead of this disease; and found always the lungs firmly adherent to the pleura; and, on the side which did not resound, a lobe hard, indurated, and more or less purulent.

College of France, invented the stethoscope and elaborated the method of examining the chest by auscultation in his "Traité de l'auscultation médiate" (1819).

LAËNNEC: TREATISE ON MEDIATE AUSCULTATION

RESPIRATORY PULMONARY SOUND.—If one applies the stethoscope stripped of its obturator to the thorax of a healthy man one hears during inspiration and expiration a light but extremely distinct murmur, which indicates the entrance of the air into the lung-tissue and its expulsion. This murmur may be compared to that of a bellows of which the valve makes no noise, or better still to that which is heard by the unaided ear when a man during profound but peaceful sleep draws from time to time a deep breath.

. . . The *crepitant moist* râle is a noise which evidently arises in the lung-tissue. One may compare it to that which is made by salt that one causes to break down at a gentle heat in a pan, to that which a dry bladder gives when one blows it up, or better still to that which is heard when one squeezes between the fingers the tissue of a lung that is healthy and puffed up with air: it is only a little stronger than the last; and, beyond the crackling, it carries with it a well-marked sense of moistness. It is the pathognomonic sign of peripneumonia in the first stage; it ceases to make itself heard as soon as the lung has become hepatized, and it reappears when resolution takes place.

Thor
edicine (History)

